

# The COMPUTER PAPER™

WESTERN CANADA'S COMPUTER INFORMATION SOURCE

NEWS • FEATURES • REVIEWS • EVENTS

**\$1.95**

**TAXES**

**ACCOUNTING**  
Survey of PC Packages

Make noise  
**SOUNDS  
GREAT!**  
with your PC

MacPaint on Steroids  
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COLORSTUDIO**

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of Personal Computing  
e PCCFA Retrospective

**3D GRAPHICS**  
Get Real!

**IS YOUR ACCOUNTING SYSTEM READY?**



# WHY BUY AT CARDZ?

- Lowest prices in the area
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- Computer training available
- Special financing available
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## ALL MODELS INCLUDE:

- 10" Tower Case with LCD Monitor, 4 Keys
- PLUS: 1.44MB Floppy • Serial, Game & Parallel Ports
- System • 500 Key Keyboard
- 200W CSM Power Supply • VHS Card
- All Parts Backed by Warranty

## FEATURE SYSTEMS

386SX • 1MB RAM, Tower Case	\$999
386-25 Plus • 25MHz CXTX Chipset • 640K RAM, Tower Case	\$1299
386-33 • 33MHz • 1MB RAM, Tower Case	\$1399
386-40 • 40MHz CXTX • 1MB RAM, Tower Case	\$1499

## BUNDLE!

### Windows 3.0 / Microsoft Mouse

- Best Graphical User Interface
- Best Quality Mouse

Special Price  
\$169

## THE BEAUTY OF OUR WEAPONS

### CARDZ Tower SX 1MB

- Runs all the new MS Software
- 801 L20 Tower with 200MHz P40 CSM
- 1.44MB Floppy Disk
- 500 Key Keyboard
- VHS Card
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor

\$1999

Special Price  
\$1399

### CARDZ Tower 386-25 1MB

- 801 L20 Tower with 200MHz P40 CSM
- 1.44MB Floppy Disk
- 500 Key Keyboard
- VHS Card
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor

\$2499

Special Price  
\$1999

### The CAD 33

- 801 L20 Tower with 200MHz P40 CSM
- 1.44MB Floppy Disk
- 500 Key Keyboard
- VHS Card
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor

\$2999

Special Price  
\$2499

### Personal Workstation

#### CARDZ 486

- 486 33MHz Processor, New Version
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor
- 10" LCD Monitor with 10" x 10" Monitor

\$3895

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\$6995

## SHOPPING LIST

### Miscellaneous

10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199

### Video Cards

10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199

### VGA Monitors

10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
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### Mouse Hardware

10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
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### Motherboards

10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
10" LCD Monitor with 10" x 10" Monitor	\$199
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### Go Pro's, Misc, etc.

10" LCD Monitor with 10" x 10" Monitor	\$199
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### Hard Drives (HDD)

10" LCD Monitor with 10" x 10" Monitor	\$199
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### Hard Drive Controllers

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### For Machines/For Cards

10" LCD Monitor with 10" x 10" Monitor	\$199
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### Scanners/OCR

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### Laptops

10" LCD Monitor with 10" x 10" Monitor	\$199
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### Printers

10" LCD Monitor with 10" x 10" Monitor	\$199
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10" LCD Monitor with 10" x 10" Monitor	\$199
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### Control 80

10" LCD Monitor with 10" x 10" Monitor	\$199
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## BEST BUYZ!

### 386SX Laptop

- 386SX 10MHz Processor
- 10" LCD Monitor
- 10" LCD Monitor

### Super VGA Hi-Res Anamorphic Monitor

- 10" LCD Monitor
- 10" LCD Monitor
- 10" LCD Monitor

### New! Super VGA Monitor

- 10" LCD Monitor
- 10" LCD Monitor
- 10" LCD Monitor

### Super VGA Monitor

- 10" LCD Monitor
- 10" LCD Monitor
- 10" LCD Monitor

### Super VGA Monitor

- 10" LCD Monitor
- 10" LCD Monitor
- 10" LCD Monitor

Star 24 Pin Printer \$399

### Fast Upgrade

- 10" LCD Monitor
- 10" LCD Monitor
- 10" LCD Monitor

### Super VGA Monitor

- 10" LCD Monitor
- 10" LCD Monitor
- 10" LCD Monitor

### Mouse

- 10" LCD Monitor
- 10" LCD Monitor
- 10" LCD Monitor

Special Price  
\$289



Tower Case with Standoff on the left  
on the right



## 386 / 486 COMPUTERS

Ph. 732-8400 2425 Barnard St., Vancouver, B.C. Fax 732-8412

Open 9:30 - 6:00 Mon - Sat  
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MINIMUM ONE YEAR  
WARRANTY, 100% ON  
EVERYTHING WE SELL

EXTENDED  
WARRANTIES ARE  
AVAILABLE

TECHNICAL STAFF



486 10MHz Processor  
10" LCD Monitor  
10" LCD Monitor

486 10MHz Processor  
10" LCD Monitor  
10" LCD Monitor

# TWO YEAR WARRANTY

ON ALL MULTITERM COMPUTER SYSTEMS AND DATATRIN COMPUTER SYSTEMS

## BYTEWELL 286 AT

- 80386 and 80287 CPUs
- 1 MB 1600 MHz on Board
- 1 2MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Monochrome Active Monitor
- ONE YEAR WARRANTY

System Price: \$1399

## BYTEWELL 386 SX

- 80386 16MHz, 0.16S
- 1 MB 1600
- 1 2MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Monochrome Active Monitor
- ONE YEAR WARRANTY

System Price: \$1799

## BYTEWELL 386-286X

- 80386 286MHz CPU/S
- 1 MB 1600
- 1 2MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Monochrome Active Monitor
- ONE YEAR WARRANTY

System Price: \$2299

## BYTEWELL 386-28C

- 80386 286MHz CPU/S, with 1MB fast cache RAM
- 1 MB 1600 (RAM)
- 1 2MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Monochrome Active Monitor
- ONE YEAR WARRANTY

System Price: \$3299

## BYTEWELL 386-33C

- 80386 33MHz CPU/S, with 1MB fast cache RAM
- 1 MB 1600 (RAM)
- 1 2MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Monochrome Active Monitor
- ONE YEAR WARRANTY

System Price: \$3499

## MULTITERM MT-286-12

- 80386 12MHz CPU/S
- 1 MB 1600 MHz on Board
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY CPU, ONE YEAR ON MONITOR

Only: \$1460

## MULTITERM MT-386SX

- 80386 33MHz CPU/S
- 1 MB 1600 MHz on Board
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY CPU, ONE YEAR ON MONITOR

Only: \$1870



Quality  
that  
lasts!

## MULTITERM MT-386-25

- 80386 25MHz CPU/S
- 1 MB 1600 MHz on Board
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY CPU, ONE YEAR ON MONITOR

Only: \$2430

## MULTITERM MT-386-29C

- 80386 29MHz CPU/S
- 1 MB 1600 MHz on Board
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY CPU, ONE YEAR ON MONITOR

Only: \$2999

## MULTITERM MT-386-33C

- 80386 33MHz CPU/S
- 1 MB 1600 MHz on Board
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY CPU, ONE YEAR ON MONITOR

Only: \$3270



## DATATRIN DPC-2112 AT

- 80386 16MHz CPU/S
- 1 MB 1600
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY

Only: \$1399

## DATATRIN DPC-3016 SX

- 80386 16MHz CPU/S
- 1 MB 1600
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY

Only: \$1982

## DATATRIN DPC-3325 386

- 80386 33MHz CPU/S
- 1 MB 1600
- 1 2 MB 1600 Mega Drive
- 40MB 1600 Hard Disk
- 17" Paper White Monitor
- TWO YEAR WARRANTY

Only: \$3042



# UNISYS



## PERIPHERALS

Monitors			
17" Active Pk	\$199	15" Active Pk	\$149
15" Passive Pk	\$149	15" Passive Pk	\$149

Hard Drives			
40MB 1600	\$49	40MB 1600	\$109
40MB 1600	\$49	40MB 1600	\$109
40MB 1600	\$49	40MB 1600	\$109

Printers			
40MB 1600	\$49	40MB 1600	\$109
40MB 1600	\$49	40MB 1600	\$109
40MB 1600	\$49	40MB 1600	\$109

## NOVELL DISKLESS 3 USER SYSTEM \$5254



286 Novell



286 12MHz



286 12MHz

CMG Computers Plus Inc.  
1025 Hwy Ave. 10  
Calgary, Alberta T2C 1P1  
Tel: 403-270-0870 Fax: 403-270-0871

# DPE COMPUTERS (Since 1983)

502-1112 West Pender, Vancouver, B.C. V6C 2S1  
Tel: 604-683-7547 Fax: 604-683-0210

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SEE OUR NETWORKING  
AD - page 69





# COMPUTER EMPIRE



CSM MANAGEMENT & CONSULTING INC.

## OCTOBER SPECIAL

### Empire 486-25MHz

- 1MB RAM
- 1.2 & 1.44MB Floppy
- I/O Ports
- Super VGA 1024 x 768 Monitor w/cable
- Tower Case
- Enhanced Keyboard

**\$4028**

### Empire 386-33MHz

- 1MB RAM
- 1.2MB Floppy
- I/O Ports
- Super VGA 1024 x 768 Monitor w/cable
- Enhanced Keyboard

**\$2980**

### Empire 386-25MHz

- 1MB RAM
- 1.2MB Floppy
- I/O Ports
- Super VGA 1024 x 768 Monitor w/cable
- Enhanced Keyboard

**\$1988**

### Empire 386SX 16MHz

- 1MB RAM
- 1.2MB Floppy
- I/O Ports
- Mono graphics monitor
- Enhanced Keyboard

**\$1089**

### Empire AT 286

- 1MB RAM
- 1.2 MB Floppy
- I/O Ports
- Mono graphics monitor
- Enhanced Keyboard

**\$788**

LEASE TO OWN (24 PAYMENTS) AVAILABLE

### DEMO CLEARANCE SALE

ALL DEMO UNITS  
MUST GO

computer systems start  
at \$399 including  
monitor.

*Resolving no phone enquiries due  
to large amount of phone calls.*

PLEASE COME IN PERSON TO  
SEE AND DISCUSS THE DEAL.

## EMPIRE MEMBERSHIP

### Benefits:

- 30% off five years warranty plan
- 30% off computer tune-up
- 30% off computer classes
- Can purchase computer goods at dealer's cost plus handling charges
- Free scenic calendar 1991
- Free deluxe ball point pen
- Free draw eligibility for one 386 computer

**PLEASE  
JOIN US**

**MEMBERSHIP  
HOTLINE:**

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(24 HOURS)**

### COMPUTER TUNE-UP

Our best-rated maintenance program has been setup for years. For one customer. Now we are extending this service to all other customers who require the service, including:

- Hardware diagnostics on memory, hard drive, floppy drive, video interface, clock & calendar, serial/parallel ports interface
- Cleaning surface area of computer, monitor and keyboard
- Hard drive performance test
- Recovering all internal area
- Clean floppy drive head
- Re-format whole system

**\$77**

### 5 YEAR WARRANTY PLAN

Parts & Labour	Purchase \$300.00 to \$1250	Purchase \$1250 to \$2500	Purchase \$2500 to \$4000
5 Years Total Premium	\$250	\$400	\$475
3 Years Total Premium	\$150	\$250	\$275

### PRE-ORDER SALE

Open to all (no membership required)

#### 286 AT System

- 13MHz • 1MB RAM
- 1.2MB Floppy • AT I/O
- 42MB Hard Disk
- High res. Monitor
- Enhanced Keyboard

**\$988**

reg. \$1088

#### 386SX System

- 16MHz • 1MB RAM
- 1.2MB Floppy • AT I/O
- 42MB Hard Disk
- High res. Monitor
- Enhanced Keyboard

**\$1348**

reg. \$1548

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Membership: 649-7281 Fax: 874-1668

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EXCELLOR®  
BUSINESS MACHINESSetup & Support  
Package

## EXCELLOR® BUSINESS MACHINES

Leading edge in technology, powerful 386 and 486 based computers for business and engineering applications.



## COMPUTER FURNITURE SALE

Leather Chair  
Pneumatic Swivel Adj.

\$429

Workstation



\$239

EZ-Computer Desk



\$179

EZ-Stools



\$169

Shuttle Station



\$229

## COMPUMAX with Roland®

Get a Morse & Dr. Halo IV  
Graphic Software  
with purchase of  
DataTrain DPC 2112 Computer  
• Introduction to Computer  
• DataTrain 2112 Computer  
• Monitor and Hard Drive  
• 2 Year Warranty

\$595

Reg. \$1199



Limited Quantities

Authorized DataTrain Dealer

### COMPUTERS

286-4 Mega	\$799
386-50	\$1,199
Power Day 386	\$899
Costa 386 2112	\$899
Costa 386 386	\$1,499
487 Mega 386	\$1,299
487 Pentium 386	\$1,299
487 486-034-0390	

### BOOKS 20-40% OFF

Using Accessible Language	\$27.50
Upper Programming Guide	\$30.00
Upper Level Computer	\$17.50
Using C++	\$24.00
Using Pascal	\$25.00
Using Java	\$23.00
Using Perl	\$23.00
Using Python	\$23.00
Using Ruby	\$23.00
Using Tcl/Tk	\$23.00
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### LAPTOPS

Portable Power	\$1,199
Portable Power 386	\$1,199
Portable Power 486	\$1,199
Portable Power 586	\$1,199
Portable Power 686	\$1,199
Portable Power 786	\$1,199
Portable Power 886	\$1,199
Portable Power 986	\$1,199
Portable Power 1086	\$1,199
Portable Power 1186	\$1,199
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### PRINTERS/DIGITIZERS/ PLOTTERS

Graphics Printer	\$225.00
Graphics Printer 256/256	\$225.00
Graphics Printer 512/512	\$225.00
Graphics Printer 1024/1024	\$225.00
Graphics Printer 2048/2048	\$225.00
Graphics Printer 4096/4096	\$225.00
Graphics Printer 8192/8192	\$225.00
Graphics Printer 16384/16384	\$225.00
Graphics Printer 32768/32768	\$225.00
Graphics Printer 65536/65536	\$225.00
Graphics Printer 131072/131072	\$225.00

### FAX / MODEM

Fax Card Interface	\$299.00
Fax Card Interface 256/256	\$299.00
Fax Card Interface 512/512	\$299.00
Fax Card Interface 1024/1024	\$299.00
Fax Card Interface 2048/2048	\$299.00
Fax Card Interface 4096/4096	\$299.00
Fax Card Interface 8192/8192	\$299.00
Fax Card Interface 16384/16384	\$299.00
Fax Card Interface 32768/32768	\$299.00
Fax Card Interface 65536/65536	\$299.00
Fax Card Interface 131072/131072	\$299.00

HALY DONG  
HIGH QUALITY  
FIBER OPTIC  
\$8.99  
each of 100

### MONITORS

Any Monitor 15" Color Monitor Special	\$299.00
Any Monitor 15" Color Monitor Special	\$299.00
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Any Monitor 15" Color Monitor Special	\$299.00
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Any Monitor 15" Color Monitor Special	\$299.00
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### SOFTWARE

Software 15"	\$79.00
Software 15"	\$79.00
Software 15"	\$79.00
Software 15"	\$79.00
Software 15"	\$79.00
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Software 15"	\$79.00
Software 15"	\$79.00

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# A PORSCHE FOR THE PRICE OF A VOLKSWAGEN!

## Introducing the Intra LT-386SX Laptop



### Intra™ LT-386SX

- ▶ An extra compact design: 386SX laptop (weight only 4.9 kg and 6 cm high), similar in dimension and weight to a letter size notebook pc, but much more powerful than a notebook.
- ▶ Compatible with MS-DOS software, OS/2®, MS-DOS®, Unix®, Xenix®, Windows 2.x/3.0®, AutoCad®, Novell®, Laplink®, Ventura®, DESQview®, Office 3.0/4.0®, Lotus 1.23®, Carbon Copy®, and many more.
- ▶ High resolution 640 x 480 VGA display. Features a dot pitch of only 0.27mm. 16 greyscale, background reversible, supports external VGA monitor.
- ▶ Long battery life, keeps about 3 hours of continuous operation and with a fast charge function of within 3 hours.
- ▶ Display panel can be folded down to a flat position enabling you to directly use the external monitor's screen in front of you.
- ▶ Uses double sided SMD subassembly technology to guarantee a high quality and reliability. All internal parts manufactured in Japan.

**\$3,950** W/MS DOS 4.01

**JUST  
COMPARE  
THE  
FACTS...**

	INTRA LT-386SX	TOSHIBA T386SX	NEC POWERMATE PORTABLE SX	TANDEM LT-386SX
CPU	Intel 386	Intel 386	Intel 386	Intel 386
OS/2 COMPATIBLE	Yes	Yes	Yes	Yes
MS-DOS	MS-DOS 4.01	MS-DOS 4.01	MS-DOS 4.01	MS-DOS 4.01
RAM	1 MB	1 MB	1 MB	1 MB
Hard Disk	10 MB	10 MB	10 MB	10 MB
Display	640 x 480	640 x 480	640 x 480	640 x 480
Keyboard	Full size	Full size	Full size	Full size
Weight	4.9 kg	4.9 kg	4.9 kg	4.9 kg
Price	\$3,950	\$4,100	\$4,100	\$4,100



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## WHAT'S NEW



## Goodbye C Prompt

A study funded by Microsoft and Zenith Data Systems and independently conducted by researchers Tempa, Baxter & Sauer estimated that benefits of the Graphical User Interface (GUI) shown that, with a GUI, employees work faster, work better, learn higher productivity, require fewer trainings, require lower wages, and are better able to multi-task and reprogram. Concluded results showed that GUI were accomplished 38% more correct work in the same time.

Interestingly, TBS found no statistically significant difference between a test group using Macintosh and another group using PCs running Windows. Not surprisingly, Macintosh scored 50% less more. Contact them at (416) 593-0094.



## The Penny Group

The next time you drop in to your local computer store, you should ask to look for the Penny Group's new full-color catalog of hardware and software for IBM-DOS, Macintosh, Apple and Atari computers. The first catalog showcases some of the most popular products ever produced and short descriptions. The Penny Group, Canada's National Independent Computer Dealer Association, consists of over fifty of the oldest and most established computer dealers in Western Canada.

## Sell to the U.S.

A one-day seminar, Direct Mail/Marketing to the U.S., is to be held in Victoria on Thursday, October 25th and in Vancouver on Thursday, November 8th. The \$100 seminar, aimed at B.C. small business, distributors, agents, consultants and other business advisors, promises to show attendees how to use such as direct marketing and lead generation techniques to quickly and economically penetrate the lucrative U.S. market. For more info, contact Jim Pettigrew at International Market Access (404) 967-5510.

## Calling all CEOs

CEOs and owners of privately held software firms, as well software personnel

in the business of software technology, will want to attend our conference entitled Selling Up Software One, presented by the Canada Group, along with Software PC/WARE, CDS and SOCA. The conference, to be held October 26-28 in 8-10 am to noon at the Fair Pacific Hotel in Vancouver, will address how to select, prepare and execute a merger, sale or strategic alliance of a privately held software company. Registration costs \$100. For further information on speakers and agenda for full price. Contact the Canada Group at (204) 455-8281 or toll-free (800) 421-2051.



## No Unauthorized Entry

A new security device called the Bio-Passport system increases the depth of a computer user's knowledge when entering a password and opens 10 times more protection than simply using a static password, the security device produces access and keeps a record of the entry attempt. If you think that this sounds just a wee bit off the wall, consider this: the market for such biometric devices in the United States alone is estimated to be \$100,000,000 for 1990, while a total of \$1 billion is spent annually on all information technology security. The patented Bio-Passport technology is owned by Bio-Passport Security Systems, Inc., a wholly owned subsidiary of Vancouver's Thos. Resources Ltd. Contact them at (604) 561-4404.

## Color Reference

Computer Color - 32,000 Computer Generated Pastel Colors is the title of a new book by Microsoft and Pui Reproduction (129-95) from Chronicle Books/Random. Called a "must-have reference for anyone who works with computers and color," the 18-000 CMYK color samples show the correct screen percentages for each ink, allowing graphic artists, designers and desktop publishers to see exactly what the final color will look like, before printing.

Look for it in your local bookstore, or contact Barnes & Noble or Van Nostrand Reinhold (800) 575-0581.

## VEPA Publishes New Rates

Membership rates to VEPA, the Vancouver Electronic Publishing Association, are increasing. Overdue list to \$25 per year for single memberships, and \$380 per year for corporate memberships (up to nine memberships cards). Contact VEPA at (604) 755-9550.

## A Colorful Plot

If you're in the market for a color electronic plotter and have an idea

SUPERIOR LASER SUPPLY  
Your Recharge Specialists

## LASER PRINTERS

H.P. is GOOD... But have you considered a **brother**

## HL-4

A compact individual local quality and high resolution graphics page printer

**\$1369.** MS. \$1499  
3 Printer Finishes • Full Control Panel • 100% Duty Cycle

## HL-80

By Brother is the HL-4, LASER Application 20 Pages Per Minute, 100% Duty Cycle, 100% PC Network, 100% Duty Cycle, 100%

Lowest Two Year Warranty

**\$1999.** MS. \$2244  
3 Printer Finishes • Full Control Panel • 100% Duty Cycle

## TONERS

HP/ST/EP/MS

HP/ST/EP/MS

HP/ST/EP/MS

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version supports the Co-communications Toolbox, internal storage and scabinet fonts, and many other PostScript-like features. Current (individual) prices range from \$20 to \$250, and 68070 computers as serial 168 inches offer for users of MacPrint, Copypilot and DocuMixer. For more information, contact GDT Software at (604) 891-0111.



B.C. Minister of Tourism, Cliff Michael, Assistant Deputy Minister, Marketing, A.A. Van Kuylen and Robert White presented Lloyd Haddock's "Microbase" program that is an alternative to staff.

### B.C. Tourism Goes High-tech

VANCOUVER, B.C., Sept. 19 — In what the Ministry of Tourism called a "low high-tech outcome, combining computer technology with tourism marketing," B.C. Minister of Tourism Cliff Michael, awarded a computer program designed especially to encourage more

tourism to west B.C.

Packaged with an expensive-looking brochure (a 17" x 24" fold-out panoramic collage, National British Columbia), the Microbase computer database contains an extensive HyperCard "stack" of air routes, scenic and wildlife photos, and other information. A new reservation program, AddMation, designed by Vancouver's Motion Works Inc. is following "Microbase." Its brochure, "Microbase," is a brochure offering custom information. Mac users can check out the travel and vacation spots of B.C.'s great outdoors.

60,000 copies of the brochure and data are slated for distribution, and users are encouraged to freely distribute the program on the internet. According to the brochure, Mac users "need to be the adventurous type — mostly the kind of people who would have a terrific time taking our views, taking our vacations or taking our frequent trips." (Editor's note: And let us get money, too.)

Apparently, this is only the first step in B.C. Tourism's high-tech plans. Mr. Michael said that future plans included using low-tech HyperCard brochures to provide local information about tourist attractions. Road signs displaying station information would encourage parking motorists to leave in the morning. Also planned are TV brochures for hotels in various spots and touch-screen information panels for B.C. ferries.

The Minister indicated that he is looking after information or promotional use, that visitors could be more interested. Contact: Robert Schaff, Communications, Ministry of Tourism, 604/254-0033 or Joseph MacLean, Motion Works 604/732-0299.

## NEWSBYTES

### Atari

#### Atari Unveils 32 MHz TT Series In West Germany

EDDINGHEIM, WEST GERMANY, AUG. 28 (AP) — Atari has just on display greater test results of its 32MHz-based TT machine, a year late and still without the long-promised Unix operating system. The machine was the Atari TT in Düsseldorf, August 24-26.

An annual event, the Atari Fair has grown rapidly to the point where it now fills over 30,000 square meters of exhibition hall, with more than 300 exhibits from 14 countries. The organizers were expecting over 50,000 visitors mainly from Belgium, France, and Holland during the three days.

Atari claims its TT computers are completely compatible with XT software and peripherals, and runs the program 3.11 (also known as an 80386) processor. The machine also comes with a new version of the DOS operating system and the GEM graphical environment, supplied by Atari.

The TT machine comes with 2MB (optional) of RAM, upgradeable to 20MB, and Atari expects most machines to be sold with 1MB. Upgradeable memory will be sold for \$1,000 to \$1,500, depending on configuration.

Those interested in computers should be the lack of Unix. According to Bob Gladson, UK managing director for Atari, "We've been developing the TT so long we got caught in the change-over

from Version 5 release 5.1 to Version 6. But we're upgrading to 7.0 by showing a demonstration in March, shipping in April." Gladson pointed out the need of low important Unix would be in the TT's success. "We're Unix market delinquency, by definition we'll be late," he said. "We'll own machine make Unix successful too."

However, one of Atari's main targets for the machine is the education market, and Unix will be useful, if not essential, in helping the company to reach that successfully enough.

Atari's head, Steve Wozniak, did think the new machine would have a positive effect on sales of existing machines. "I like being my own main competitor," he said. "I can only help the 32 if prices are more creditably breaking an upgrade path."

He also hinted at forthcoming 32MHz models but refused to give details. "Note that the TT is not just the wrong way now products over the next year," he said. "We're not announcing new machine models ready to go, that's a mistake we've made before."

### Apple

#### HyperCard 2.0 Approaches CUPERTINO, CALIFORNIA, SEP. 19

(AP) — The industry's biggest bet, but it appears that Apple Computer's long-awaited HyperCard 2.0 is almost ready to ship. An Apple spokeswoman told Newsday that developers have been sent a "golden master" of the program, perhaps first described as an end-user programming tool.

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time, Adobe Chairman John Warnock appears ready to step back on the sidelines.

Only 15 months ago, Apple announced emphatically that it was selling its 10 percent stake in Adobe, which owns the PostScript page-description language on which the vast majority of laser printers are based. Apple, it seemed, had adopted low-development-cost means of high-quality printing. Adobe's stock plunged.

Thirteen months later, Apple admitted it wouldn't develop its own page-description language after all but would instead license TrueType and PostScript, which include the laser Minolta's was writing. Why rely on Minolta's (with whom Apple was said to be negotiating an Adobe match) and not Adobe? Adobe was charging for the use of PostScript; Minolta would license TrueType for free. Also, TrueType was going to be used in OS/2, allowing Apple to avoid using the PC market.

Two days after the Apple/Minolta handshake, Warnock stood up at a trade show and — tears in his eyes — called TrueType “impressive” and “the biggest launch of garbage just months-past-me I’ve ever been in my life.” He then announced dramatically that Adobe would publish the proprietary specifications to PostScript and its font technology — giving away the keys to the empire.

That week, just as suddenly as they split, Apple and Adobe mutually bowed and made up, though precisely why remains a mystery. The companies, according to Adobe, agreed to “touch a new and expanded technology in many applications.” The announcement and Adobe and Apple plan “to continue to work together to provide new products based on Adobe’s PostScript software and printer technology developed by Apple Computer.”

There was no agreement announced, no signatures at the bottom of contracts. Apple spokeswoman Penny Telford said the intent was to “give as much flexibility as we can in technology, licensing or format software.” TrueType under license problem. “The other, the real, was to ensure that TrueType would work with new versions of PostScript, though she said no new technologies were specified.

The commitment between Apple and Adobe appeared to Wall Street — Adobe stock jumped 3 1/8 to \$8 1/8 on the announcement.

The companies had never split completely. TrueType remains on the bottom, promised by Apple as part of its System 7 operating system, due sometime at the end of this year or early next year. PostScript has remained very much part of Apple’s future, and central to most of Apple’s client products.

Apple has said from the beginning that whatever TrueType does, it will also, compatibly with PostScript. When users was specifically interested in the announcement, with Apple spokeswoman Beverly Bannister saying that Apple “will work closely with Adobe to guarantee that all

of our common customers’ current investments in hardware and software will be protected and enhanced in the future.”

### Apple Delays System 7.0 To First Half Of 1991

CUPERTINO, CALIFORNIA, SEP 16 (NS) — Apple Computer promises to ship beta copies of System 7.0 to developers in October but says that end users won’t receive it until the first half of 1991, yet another delay in the release of the new Macintosh operating system.

Alpha versions of the software have

been available to developers since May. Developers have been growing restless over the delays and over uncertainties about what features will be included and how they will be implemented. At the same time, Apple is committed to producing error-free system software, no matter how long it takes.

“Our commitment is to produce the highest quality system software for our developers and customers,” said Roger Rosen, vice president of software engineering. Apple’s external standards for software testing are extremely rigorous, and with the additional feedback from

new developers we are confident System 7.0 will deliver traditional notions of what personal computers can do.”

### Apple Transfers HyperCard To Claris

CUPERTINO, CALIFORNIA, SEP 16 (NS) — Apple Computer will give its Claris subsidiary the responsibility for HyperCard software development, support, and distribution starting in November when HyperCard 2.0 is released. Apple has announced.

A version of HyperCard 2.0, which will



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run existing HyperCard stacks and new HyperCard 3.0 stacks, will continue to be supported by every Macintosh computer. A complete HyperCard 3.0 software system, necessary for developing stacks, will be sold by Claris.

The transfer of HyperCard will be a positive move for all parties," said Randy Bass, vice president of worldwide product marketing for Apple Computer. "Customers will benefit from the new support available without through Claris, and the active development of new HyperCard stacks, developers will appreciate the aggressive Claris marketing programs involving an expanded customer acceptance and ultimately many resulting new HyperCard solutions."

Claris, now a wholly owned subsidiary of Apple, had been open all two years operating a successful product unit. Apple suddenly restructured Claris at the beginning of August. The separate company had been set up at least partly at the expense of independent software developers, who had been wary of Apple's propensity to lock the hardware and software businesses. Contact Randy Bass, Apple Computer, (408) 576-5009.

## IBM World

### Software Automates

#### Lotus 1-2-3 Macro Handling

**HOUSTON, TEXAS SEP 15 (AP) —**Young Enterprise Industries of Houston, a micro-driven "Macro Management System" that automates the handling of macros, according to the company.

The program includes over 35 macroed macro programs, the company says, as well as automated, "ready-to-build" macro libraries. By using a "point and click" method, the user can import macros into a spreadsheet and prepare them to run, macros macros, or delete macros from the file.

Included are a Call Documentation Program, a Data Entry Program and a Print Enhancement/Line Spacing Program, as well as macros for performing time-consuming functions such as calculating depreciation and loan payments, converting monthly data to quarterly data, creating a database, and resolving the placement of data. The program is priced at US\$99.95. Call 214/720-0345 for more information.

### ATI VGA Card For US\$99

**TORONTO, ONTARIO, SEP 15 (AP) —**ATI Technologies has announced the VGA16-16, a low-end Visual Graphics Adapter (VGA) display adapter priced at US\$99. This Canadian maker of graphics hardware and software can't offer buyers at home a price under the magic \$100 barrier, however the Canadian price is US\$99.95. Call 214/720-0345 for more information.

According to ATI, the VGA16-16 offers superior performance and unmatched quality at the price of a consumer graphics card. And the company said its availability will put another nail in the coffin of other graphics standards. "It's only \$99," said Director of Marketing Henry Quan in a prepared statement. "That's not longer an issue to buy software from this VGA."

The VGA16-16 uses the same technology as the VGA16-16/16/16/16/16, which has won several awards. It began shipping late August. Contact Henry Quan,

ATI Technologies, 416-754-0718.

### Perform Pro Starts Shipping

**TORONTO, ONTARIO, SEP 15 (AP) —**Delrina Technology has begun shipping Perform Pro, a version of business processing software for Microsoft Windows 3.0.

Delrina spokesman Jeff Zancovitz says optimistic about prospects for the product in the Windows market. "The focus at Microsoft is also going to be a focus for Perform Pro," he said.

The software has two parts, Desktop and Files. The combination is available separately for US\$495. Contact: Jeff Zancovitz, Delrina Technology, 416-944-2675.

### Risk Analysis Adds for 1-2-3

**NEWFIELD, NEW YORK, SEP 15 (AP) —**Palmdale has said it will release a new version of Risk, its risk analysis and simulation software, for Lotus 1-2-3 Release 3.1.

Introduced in 1988, Risk was described by Palmdale as the most sophisticated of thousands of possible scenarios on their worksheet models. It currently supports 1-2-3 Release 3.0, 3.01 and 3.1 and Lotus Symphony releases 3.0 and 3.1.

Risk incorporates distribution and process simulation techniques. It is intended for use where subject is a spreadsheet or an application, Palmdale said. It can be used for both existing and new spreadsheets models.

Palmdale plans to integrate Risk into Release 3.1, making use of improved graphics to present graphics risk analysis results and statistics. To support the three-dimensional worksheet features available in 1-2-3 Release 3.0, which Risk does not support will be a key feature, the company said.

Risk for 1-2-3 Release 3.1 is to be available in January 1991 at a single price of \$1,299.95. Palmdale said owners of other versions of Risk will be able to upgrade them for the Release 3.1 at less cost or buy the Release 3.1 version graphics card.

Once the Release 3.1 version of Risk is shipping, Palmdale said a plan to port the add-on to 1-2-3 versions on other hardware platforms, including 1-2-3/36 on IBM mainframes, 1-2-3/36 on the C/80 Presentation Management/3600 version of 1-2-3. Contact: Bill Barton, Palmdale, (407) 877-8890.

### Compu Sales Prices Up

#### To 20 Percent

**HOUSTON, TEXAS, SEP 15 (AP) —**Compu has cut prices on a number of its desktop personal computer models including its Desktop 286s, 386s, 486s, 586-20s, 586-30s and 586-50s (multiple configurations of each) by as much as 20 percent while also cutting prices on certain accessory options by as much as 25 percent.

The new prices, while making Compu's computers more attractive to price-conscious buyers, are part of the regular marketing plan at Compu according to Joe Nohel, Compu's director of corporate relations. "This is a matter of doing business in a manner consistent throughout the computer industry," Nohel told Newsday. "As products mature, factors improve their economies of manufacture, and as a company progresses introduce new products, planned price reductions are usually instituted."







IBM vs. the challenge to IBM was to announce steps to smooth the transition period and they've done so."

Marten continued, "As a manufacturer, we won't know until the machines are actually in customer's hands and we expect them both to be well served. The main issue is not until '91, 1992 year and to measure in the long run in 1993, as most like to do, but really on initial performance of all components. That's why it says that it will not be the fastest but, as I said, we won't really know until next year." Contact: Anne A. Karamich, IBM, 914-461-4688.

## Software Audits Hard Disks

**For Pirated, Legal Programs**  
WASHINGTON, D.C., SEP 5 (AP) —

The Software Publishers Association is offering a free disk designed to help computer distributors by developing an audit disk for legitimate and illegitimate software.

SWA's, the MS-DOS program, is designed to complement the SPA Self Audit Disk. It searches the hard disks of computers for over 500 of the most common programs used to bootstrap today. After 1987, there were "SWA audit," the program will print a listing that indicates how many copies of each application were found. Users may compare this report to purchase records to determine what software programs are authorized and which ones are unauthorized.

The SPA says it has received over 3,000 requests for the Self Audit Disk, released in February, from computer retailers in monitoring their material software policies.

"During the last year we developed," said SPA Executive Director Eric Wachs, "SWA managers have long recognized the difficulty of managing their software resources and staying within the law. We are now providing them with the tools they have requested."

Contact: Publishing Director, copy of the Self Audit Disk and SPA Audit, should be sent to your representative's Internet address and Audit Disk, 1401 Connecticut Ave., N.W., Suite 901, Washington, D.C. 20004. Contact: Joel Pollock, SPA.

## Symantec Offers

### Graphics 2.0

SAN JOSE, CALIFORNIA, SEP 5 (AP) — Symantec version 1.0 is now available from Symantec. This upgrade to the existing product can be run in either a memory resident or standalone product using less than 30K of memory. Graphics 2.0 includes instructions in Lotus Freelance Plus and Harvard Graphics. Also new is a built-in calendar which can take dates assigned to hard disks and make them accessible by one keypress. Users can also make them such as person or priority to a headline. There is also enhanced word processing and features such as page preview. Customers can be repaired directly to WordPerfect and other word processors.

The program is US\$295 to new purchasers but US\$150 to users of Graphics 1.0, except for those who bought the product after July 6 — they'll get the upgrade free. Contact: Tom Karamich, Symantec, 408-752-6564.

## Compaq LTR Laptops

### Developing Hairline Cracks

HOUSTON, TEXAS, AUG 31 (AP) —

Compaq Computer Corporation is expanding the warranty on the plastic cases housing its LTR and LTR 386 notebook computers after many of them have developed hairline cracks.

The problem, "We do not endorse," according to Compaq spokeswoman Helen Goble, although the company admits it does not know how many are involved. They were first identified in the problem by dealers. She could not say exactly what portion of the case was most likely to develop the cracks.

The company is currently investigating the cause of the hair fractures, but it hasn't been obvious. "It's pretty common," she said by Newsday. She said Compaq is looking to a replacement for the plastic used in the casing.

Dealers are offering owners of the cracked LTR's a computer extension on the warranty covering damage to the plastic case.



## Toronto Firm Aims 486 At

### Multimedia, CAD Markets

TORONTO, ONTARIO, AUG 31 (AP) — MD Microcomputers has announced the IPC-486 personal computer, a low-cost system using a 386-navigator Intel 80486 microprocessor.

Chuck Young, MD's president of marketing, told Newsday he expects the system to sell mainly as a mid-range machine and to serve who's always in power for computer-aided design (CAD) work. MD will ship the machine with the MD-486 operating system, but will also offer OS/2 or Unix System V.

The IPC-486 is available now in Canada. Young said the company is "not geared up" as yet to sell the machine in the United States, though MD does have two offices in California. Those offices are concentrating on meeting computer companies, he said, but MD hopes to launch the IPC-486 in the United States within three months.

MD has six branch offices across Canada, with another scheduled to open later this year, Young said. The company's marketing, Everett Manufacturing, backs the IPC-486 machine.

The IPC-486 comes with one full-height and one half-height drive bays, 16-bit power supply, one parallel and two serial ports, eight expansion slots and a VGA monitor and adapter. Five megabytes of RAM, a 10-megabyte hard disk and 1.44-megabyte 5 1/4-inch floppy disks are included in the standard configuration, priced at Cdn\$190. Contact: Chuck Young, MD Microcomputers, 416-494-2250.

## Zos Offers New Notebook

ST. PAUL, MINNESOTA, AUG 31 (AP) — Zos International has introduced a US\$2,000, seven-pound notebook computer based on Intel's 80386 microprocessor. The machine, which is being manufactured at the firm's notebook computer production facility in St. Paul, Minnesota, has one megabyte of memory and a stated to ship in mid-September.

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## PC Utility Doubles Hard Disk Capacity

ANN ARBOR, MICHIGAN, AUG. 15 (AP) — Western Systems is shipping DUALDISK, a new PC-compatible utility that the company says is designed to double the capacity of a customer's existing hard disk.

The new program's utility is installed by inserting a floppy disk and following a set of directions that create an additional logical DOS "partitioned disk" from a portion of a physical hard drive. Reformatting of the hard disk is not required, according to the company.

Western's utility is used to create extended disk, DUALDISK, increases disk capacity in an average of 50 percent, and 50 megabytes in the system are accessed normally, whether they are on an extended disk, or purchased DOS drive, according to Western.

Up to two extended-disks can be created for data organization and a password can be imposed to each, if needed, the company says.

Sold with a 30-day, non-refundable money-back guarantee, DUALDISK costs for US\$59.95. Call 661/548-8015 or 415-556-5555.

## Software Link Announces

9-User Version of PC-MOS

ROCKINGHAM, GEORGIA, AUG. 18 (AP) — The Software Link is shipping a new 9-user version of its PC-MOS operating system, a PC-compatible operating system developed a few years ago to get around old problems with MS-DOS by reformatting and the 640K memory barrier. The 9-user version of the software PC-MOS costs US\$295. The marketing director John Green and today's new powerful 80386 and 80486-based computers qualified development of the new operating system, which lets companies link up to 8 machines through serial cables and share files without a Local Area Network. The company's telephone service center in 1989, a 24-hour service center for US\$995, and the 25-user version costs US\$995.

As updates to the main program, Version 4.1 was also announced. The new version lets users alter the program's memory and, according to the company, are also used to improve system performance when adapting to applications in running systems and Windows 3.0 compatibility was also added. Contact John McLean, The Software Link, 404-448-5455

## Unix World

Unix Users Question Value of Benchmarks  
SYDNEY, AUSTRALIA, SEP. 18 (AP)

— Greg Rose, president of the Australian Unix Users Group, says that too many Unix users are evaluating systems on benchmarks alone, while ignoring other factors such as support and timeliness of software.

His main knowledge that this was one of the issues to be discussed at his group's annual exhibition and conference to be held at Canberra on September 25 to 28. The conference theme is "Unix: The Computing Platform for the 90's."

Rose expects about 100 delegates and 1000 exhibition visitors.

## UK: New PICK Quarterly Magazine Released

BIRMINGHAM, ENGLAND, SEP. 10 (AP) — A new UK language magazine — Pick Quarterly — has been published by ALLAN Systems and Marketing. It costs UK£ 25 for a United Kingdom subscription.

The quarterly is published in a supplement to the Pick Systems Guide, a directory of UK hardware, software, training courses, literature and companies worldwide. A joint distributed package is available for the purchase of the Guide and the Quarterly together. Contact Allan Pickford, ALLAN Systems and Marketing, Tel. 0923-50155

## IBM/Hitachi OSF Alliance Seen As Harbinger Of Future

TOKYO, JAPAN, SEP. 7 (AP) — The agreement between IBM and Hitachi, major members of OSF or Open Software Foundation, to combine on porting software to meet OSF/386 specifications this week has been greeted with mixed feelings here in Japan.

Some see the alliance, involving 50 members from IBM and 90 from Hitachi, according to industry sources, as the real of cooperation within the Japanese computer industry without under the protection provided by MITI, or Ministry of International Trade and Industry. In the 1980s, many Japanese electronic firms joined forces with globally advanced Western companies. Hitachi and NEC, NEC and Ricoh, Toshiba and Sony, Citizen and Citizen, and Fujitsu made a pact in 1984 but ended down with Toshiba, a spin-off of 1989.

Then in 1991, MITI arranged a series of meetings among Japanese firms to develop general-purpose computers. Hitachi and Fujitsu moved up to make an OSF-compatible machine, Toshiba and NEC moved down to make OSF-compatible machines in the 1990s, and a number of others in the 1990s, and Mitsubishi joined with Oki.

Japanese proposals suggest the relationship between Hitachi and Fujitsu, which relied on the first IBM-compatible M series general-purpose computer in 1975, has come to the turning point.

A Hitachi official, however, stressed that the relationship with IBM partners only under firm needs and has no effect on its other business.

Fujitsu clearly parted separate from partner Hitachi in the Unix arena when acquired U.S.-based ICL to build up its Unix business. Fujitsu has developed ICL to Unix contributions for Unix International.

Also, Hitachi has recruited with IBM since the company moved in 1985, in which Hitachi has been in the technical information from IBM with

### Microsoft's help.

In recent years, the attention has changed between Western nations and Japanese makers, and the Japanese computer industry is expected to take a turning point in the 1990's.

### Ashton-Tate Introduces Powerstrip, Spreadsheet For NOXT

TORRANCE, CALIFORNIA, SEP 5 (NS) — Ashton-Tate is introducing Powerstrip, a spreadsheet designed to take advantage of the graphical and multitasking capabilities of NOXT workstations. The product, for which no pricing or shipping date has been announced, offers 3-D graphics, mouse annotations, spreadsheet publishing capabilities, and a graphical user interface.

Ashton-Tate uses the program also for nonproprietary desktop workstations, consolidation of multiple spreadsheets, spreadsheet linking, Lotus 1-2-3 file import and export, 340 charts with five columns, and 15 chart types.

One of its most unique features is the report annotation. Comments can be reported directly on any spreadsheet using the NOXT system's built-in mail client.

NOXT is expected to roll out new workstations September 15 at a launch press conference at Dorco Symphony Hall.

## Trends

### Kodak Introduces New Digital Printing System

ROCHESTER, NEW YORK, SEP 14 (NS) — Kodak has introduced its new digital printing system designed to work on networks of PCs and Macintoshes.

Designed to be "the most dramatic advance in office productivity since the advent of" according to the company's Copy Products Division, the system operates at speeds up to 99 pages per minute, and supports PostScript page-description language. The system costs US\$150,000 and is aimed at companies that print hundreds of thousands of copies of documents each month.

The heart of the system is Landolt's L3 advanced printing software which enables users of PCs, Macintosh computers and workstations to be connected to the super-speed printer either directly or through a print server. Contact: Paul C. Allen, Director/Kodak Company, 710 7th St., 06020.

### Growing Mismatch Between U.S. Worker Skills and Job Needs

BETHESDA, MARYLAND, SEP 15 (NS) — The World Future Society has released a report showing that workers' education and current employees are poorly educated for the jobs that involve rapidly changing technology.

In "Educational Mismatch: 45 Trends for U.S. Schools," Maria Gomez and Margaret Emma Knight say that, due to rapid technological, medical, and scientific shifts, U.S. workers can't adapt to changing jobs. "Three-fourths of new work force entrants will be qualified for only 40% of the new jobs created between 1990 and 2000," said the report.

One part of the report says that the new million annual U.S. high school

graduates find the economy about US\$140 billion in lost lifetime earnings.

The authors say that while only 15 percent of future jobs will require a college degree, more than half of all jobs will require postsecondary (beyond high school) education.

The report's education trend report, abstracted from the authors' forthcoming book, "Educational Mismatch: Our Schools into the Twenty-first Century," Dr. Martin's Press, December 1990, is available from World Future Society, 4015 North Elm Ave., Bethesda, MD 20814 at 4100 for a single copy, US\$2 for each additional copy, and US\$1 each in quantity.

size of 100 or more. Contact: Timothy Willard, World Future Society, 301-454-8704.

### Report Sees 44% Growth In Workstations

TORONTO, ONTARIO, SEP 11 (NS) — Canadian workstation shipments rose 40.3 percent in 1988, according to a new report from Data Research International.

The technology market research firm predicted even stronger growth this year, with 1989 shipments rising 46.9 percent from 6440 units in 1988 units.

In revenues, this translates into

US\$190.7 million in 1989, up 50.5 percent from 1988, with a prediction of US\$209.4 million in revenues in 1989. Revenues are not growing as fast as unit shipments, Data noted, because prices are falling.

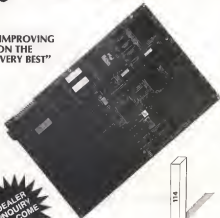
Data said Sun Microsystems retains its leading position in the Canadian workstation market, accounting for about 37 percent of shipments in 1988. That figure slipped slightly from 34 percent in 1988, the research firm added, but is likely to slip back to 30 percent this year. Hewlett-Packard and Digital Equipment took second and third place. Coming from behind are IBM and Silicon



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Graphics Contact: Charles Whaley, Texas Instruments, 414-494-6644.

Godin's Encyclopedia, and Merriam-Webster's Dictionary Library remain in the lead in the encyclopedic category, followed by Britannica, and the U.S. GPO's Library, the Encyclopedia World Atlas, the McGraw-Hill 56KT Encyclopedia, Computer Library, Starnes-Craig Bay and CIA World Fact Book.

The library added that a number of titles are moving up fast, however, and could crack the next list. Shakespeare and Merriam-Webster, Timeless of Science, the Merriam Webster Dictionary with Sound, and Virtual Values are all rising well, while U.S. Library on CD-ROM, Facts of Science and Pictorial 1990, all have the potential to crack the

list. Contact: Barry Connors, Barnes & Noble, Publishing, 201-493-7700.

## Supercomputer Seeks Substitute For Dying Spruce Forest

PITTSBURGH, PENNSYLVANIA, SEP 4 (UPI) — As the Spruce Spruce forests are being destroyed by air pollution and thereby slowing the fast road for making video, Computer Media University physicist and fellow scientist Robert Schenker is using a National Science Foundation-funded Supercomputer to analyze possible substitute materials such as carbon fiber,

composites.

So far, Mr. Schenker's research has led him to suggest that materials made from carbon fiber, which is a by-product of the dying Spruce Spruce forests, could be used to make a fast road for making video. Contact: Cheryl Dylus, National Science Foundation, 202-377-9400.

## IRD Predicts Computerized Auto Censorship

NEW CANAAN, CONNECTICUT, SEP 4 (UPI) — International Research Development Corporation's annual billion-dollar report by the U.S. government is to be spent by the U.S. government to develop a computerized highway vehicle highway system, which could be used to censor themselves in 100 million-dollar computerized highway system.

In an article in its Computer Engineering, Mapping and Transportation section, IRD, outlined prototypes and research projects in the U.S., Japan, and Western Europe.

Two types of projects are being tested in the U.S., the article continues. Internal systems are self-contained within each automobile, using internal guidance or relying on radio signals from the Local or Global Positioning System satellites. External systems use combinations of beacons, computer networks, board copper tape and sensor systems to track drivers along highways in a controlled traffic. Such systems might allow the U.S. to avoid building expensive new highways in the future.

Copies of the newsletter containing the story are being offered free to those interested in subscribing. Contact: The Agency, 202, 494-944-9444.

## New Low-Radiation Monitors Shipping

FREMONT, CALIFORNIA, SEP 4 (UPI) — Supra Design has taken the lead in the new age VDT (video display terminal) monitors by offering in the U.S. the new low-VLF (very low frequency) emission version of its monochrome and gray scale monitors for Macintosh and PCs that is safe on health.

The new low-VLF monitors have been shipping since February and are the first low radiation monitors available by VDT workers are much lighter than in the U.S. The company is also working with British authorities to develop monitors that meet new standards for VLF and ELF (extremely low frequency) emissions. They will ship in Sweden in the first quarter of 1991, the company says.

The low-VLF monitors come in the following versions: 15-inch, 17-inch, 19-inch, 21-inch, 23-inch, 25-inch, 27-inch, 29-inch, 31-inch, 33-inch, 35-inch, 37-inch, 39-inch, 41-inch, 43-inch, 45-inch, 47-inch, 49-inch, 51-inch, 53-inch, 55-inch, 57-inch, 59-inch, 61-inch, 63-inch, 65-inch, 67-inch, 69-inch, 71-inch, 73-inch, 75-inch, 77-inch, 79-inch, 81-inch, 83-inch, 85-inch, 87-inch, 89-inch, 91-inch, 93-inch, 95-inch, 97-inch, 99-inch, 101-inch, 103-inch, 105-inch, 107-inch, 109-inch, 111-inch, 113-inch, 115-inch, 117-inch, 119-inch, 121-inch, 123-inch, 125-inch, 127-inch, 129-inch, 131-inch, 133-inch, 135-inch, 137-inch, 139-inch, 141-inch, 143-inch, 145-inch, 147-inch, 149-inch, 151-inch, 153-inch, 155-inch, 157-inch, 159-inch, 161-inch, 163-inch, 165-inch, 167-inch, 169-inch, 171-inch, 173-inch, 175-inch, 177-inch, 179-inch, 181-inch, 183-inch, 185-inch, 187-inch, 189-inch, 191-inch, 193-inch, 195-inch, 197-inch, 199-inch, 201-inch, 203-inch, 205-inch, 207-inch, 209-inch, 211-inch, 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3195-inch, 3197-inch, 3199-inch, 3201-inch, 3203-inch, 3205-inch, 3207-inch, 3209-inch, 3211-inch, 3213-inch, 3215-inch, 3217-inch, 3219-inch, 3221-inch, 3223-inch, 3225-inch, 3227-inch, 3229-inch, 3231-inch, 3233-inch, 3235-inch, 3237-inch, 3239-inch, 3241-inch, 3243-inch, 3245-inch, 3247-inch, 3249-inch, 3251-inch, 3253-inch, 3255-inch, 3257-inch, 3259-inch, 3261-inch, 3263-inch, 3265-inch, 3267-inch, 3269-inch, 3271-inch, 3273-inch, 3275-inch, 3277-inch, 3279-inch, 3281-inch, 3283-inch, 3285-inch, 3287-inch, 3289-inch

only 5 percent, although Macintosh desktop publishing software sales have increased by more than 50 percent. MS-DOS games and entertainment software sales have jumped more than 40 percent while Mac entertainment software jumped 50 percent, with the largest single category attracting wordprocessing software with sales over US\$200 million.

Said to report educational software, with US\$12.7 million for MS-DOS machines and only US\$1.1 million in sales for Macintosh systems, was the smallest of the categories mentioned in the report, although it did continue to grow by 10 percent for MS-DOS machines and more than 10 percent for the Macintosh. Contact: Jodi Colwell, NPA, 202-462-0200

### Hand-Held Weather Forecasting Gadget From Japan

TOKYO, JAPAN, SEP 3 (NPA) — Fuji Corporation of Japan will sell a hand-held weather station called AMERICA starting October 1. The gadget predicts weather by combining past accumulated weather data with a current atmospheric reading measured by a built-in sensor each 10 minutes. Fuji claims that the device is 71 percent accurate in predicting weather which will occur four hours after the reading within a radius of 10 kilometers. The electronic forecastor displays weather symbols and English-language messages on the LCD (liquid crystal display) screen.

Other features include a world clock which synchronizes only display time, day, and principal cities in 24 world zones, a phone directory which can record 700 phone numbers, a calculator, and a tel-

evision.

AMERICA measures 100 by 171 by 74 millimeters, and weighs only 510 grams.

The price in Japan will be 20,000 yen (\$130) and the suggested retail price in the U.S. will be US\$129.95. Fuji claims to sell 50,000 units in the first year. Contact: Fuji Corporation, 03-5487-8111

### Berkeley Scientists Create Silicon Substrate

BERKELEY, CALIFORNIA, SEP 3 (NPA) — Scientists at the University of California at Berkeley believe that have created a plastic, or what they term a polymeric "paper" which could eventually replace silicon in computer chips. The substance, arylated polyphenylene sulfide, is a polymer that the industry is reportedly spring enthusiastically.

James Homa, assistant professor in chemistry, made his presentation before the American Chemical Society conference in Washington, D.C. Friday.

Homa told the San Francisco Chronicle that the substance upon APTs, said he would, as he traces his looking for a coating, or photoresist, for chips. During their experiments, they realized that the substance was a perfect semiconductor itself. When exposed to light, a silicon chemically, turning from an insulator into a semiconductor. Consequently the material could itself be used as a new material, instead of being attached to a silicon substrate.

He believes the substance could eliminate many of the steps currently required in the construction of tiny microcircuits on silicon wafers.

While a chip has yet to be made from

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the polymer, the material has drawn great interest from chipmakers.

## Printer Link Works Over Electrical Wiring

EVANSTON, ILLINOIS, AUG. 31 (ENR) — The United States office of DEC-Marcus Software Systems has acquired North American rights to a printer connection that sends signals over electrical wiring.

The Veritas DataLink and Definitive Printer Shaver (DPS) were launched in the United Kingdom last year and soon have introduced to the rest of Europe, DEC-Marcus's general manager, Brian Roper, told ENR. The DPS is a "portable" unit that can be used with a personal computer. The DataLink can be connected to a serial or parallel port.

To communicate, two DataLink units are plugged into the same electrical circuit. The devices should be within 100 meters (300 feet) of each other, Roper said.

The DPS also can be used as a serial printer to share a single printer. It also can act as a serial printer.

Roper said the technology is essentially the same as that used in "smart home" devices that let a computer control home appliances through devices plugged into electrical outlets.

The DataLink will be priced at \$295, while the DPS is priced at \$295.

DEC-Marcus is a subsidiary of General Electric of Great Britain. Contact: Susan Roper, DEC-Marcus, 700-448-1000. For more information, contact: John Young, DEC-Marcus, 700-448-1000.

## Hyatt New Father Of The Microprocessor

CHICAGO, CALIFORNIA, AUG. 31 (ENR) — Designer recently inventing the first microprocessor, Gilbert Hyatt has finally received a patent for named the US Patent Office for making it so difficult.

Hyatt, an engineer and technology consultant who invented the "computer on a chip" in his first Micro Computer Inc. in 1968, says the patent office "forced" him to thoroughly work through the process of invention and then "the computer on a chip" was born.

"That patent is much stronger because they already addressed those areas and put them in there. They did a big favor by being so careful," Hyatt told ENR. The US Patent Office on July 17 granted Hyatt's patent number 4,945,114 entitled "Single Chip Integrated Circuit Architecture," the claim for which was originally filed Dec. 28, 1979 based on work done in 1968.

Commenting on ENR's patent attorney Gary Hohenstein's description of Hyatt and his team's confidence that "The claim appears to cover all the elements of a microprocessor necessary to store a computer's instructions, operational instructions, and a processing circuit to process the operations in response to instructions of the processor."

He says this could be a patent "require-

ment with the internal combination engine" and says Hyatt might be able to seek royalties from the sale of every microprocessor made after the date his patent was issued — July 17, 1988. He says that an agreement that only collect royalties from the date his patent is issued, not the date of the invention.

Asked how he kept up the patent application process for 20 years, Hyatt told ENR, "You just keep plugging away. It was very important and it was worth it."

Hyatt says he has no plans to get involved with the microprocessor industry, but does want to collect some royalties. "I am not an inventor. I am an engineer and an R & D man." He will not take over the job of negotiating licenses with high-tech companies. "I am a company," he said. He has a company that will be a major step forward with respect to the microprocessor industry. "We will offer licenses to those who want them. I suspect that the people who would like patents will be interested."

Hyatt says he plans to use money gained from licensing to fund his current research and development projects in integrated circuit design, high performance processors, improved memory systems, and new display technologies. His laboratory is located in the La Jolla area of San Diego. His address is PO Box 5557, Carlsbad, CA 92008.

## VDT Safety Laws Eyed in San Francisco

SAN FRANCISCO, CALIFORNIA, AUG. 31 (ENR) — San Francisco city officials are considering legislation which would mandate safety standards for workers who use computers. San Francisco's legislation could serve as a model for the country, and attempts to make up for the absence of state or federal legislation protecting workers against repetitive motion injuries and other VDT-related health problems.

The bill, put forth by Supervisor Henry Wilentz, would require firms with at least 10 employees to give VDT workers regular breaks and ergonomic safety devices, adjustable office furniture, including wrist rests. Workers could be forced off the job for a day. An additional part of the bill requires the city to do regular monitoring of the health of VDT workers. San Francisco employers would have two years to comply with the new guidelines.

A similar bill was defeated in Suffolk County, New York this year, but San Francisco backers believe this bill has the necessary support, including that of the unions.

In June of this year, a number of reporters and editorial writers in New York City began suit against Eastman Kodak for "computer vision syndrome" which they allegedly acquired while working with Kodak's Axiom telepresence system. The USPTO machine also charged that the sight problems, reported by New York, The Village Voice, Associated Press and Associated Press News, "developed and suffered severe, permanent and disabling visual and physical disorders, as well as psychological and spiritual" from continued use of the Axiom VDT. Since the filing of that suit, others have followed.

The legislation comes as there is mounting concern about the health effects of VDTs, especially on pregnant women and on the vision of workers. Also, repetitive-motion injuries, caused by







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## GOODS &amp; SERVICES TAX

## Is Your Business Ready For The GST?



by Allen Singh, Q.C.

If you are like me, you have probably been avoiding confronting the issues surrounding the proposed Goods and Services Tax (GST). We calculated the amount of tax payable for our GST and the effect on some accounting systems, so I felt it was time to tackle another and learn something about it.

Apart from the apparent frenzy of the whole thing, it turned out to be not as complex as I had feared, although once the real implications hit, I'm sure there will still be a few wrinkles.

I recently attended a seminar put on

*Don't hit the panic button just yet, but it is time to start thinking about the effects of the GST on your business...*

by Paul Manchukewicz of Arthur Andersen & Co. which covered the big-printer issues. The following article is based on notes from this seminar. Note on the "quick method" and the "reversal method" of treating GST, and on the necessary releases were provided by Don Wilson of Wilson and Company.

When Mr. Manchukewicz was asked what he thought of the GST as a tax, his comment was the effect that, all things being equal, the government hopes to bring in an extra \$10 billion. The deficit is still growing at a rate of \$20 billion a year, so it may not make a dent in the

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growing economic black hole that government spending is creating. This is because they consider the added cost of administering the increasingly complex GST. These first estimates were that it would require 4,000,000 new tax administrators, more than existing in shipping up to 50,000-plus hours.

### Will It Pass?

But GST completed final reading in the House of Commons in April of this year. It still has to go to the Senate, but the odds are that it will pass, and on January 1, 1991 we will have a new tax system to replace the existing Federal Sales Tax (FST). One caveat has the implementation delayed until April of 1991, or possibly July 1991.

### How Is It Different From The FST?

The FST is a multiple tax rate with a narrow tax base. The single element is the manufacturing stage, and it is called a "sales tax" because when you buy something at the retail level, you don't know if you are paying it or not. Because it is levied primarily on Canadian goods, it is called a "border tax."

The GST, on the other hand, is a single tax rate with a much wider tax base, because it taxes both goods and services. It is a multi-stage tax which will be levied on primary production, manufacturing, service contractors, distribution and final services. The government claims it is a simple tax, because it is all levied on the same rate. However, to compute their portion before the GST is made more apparent, more intricate. Goods created for export will be exempt from the GST, which will supposedly lower exports.

### How Will It Work

The framework for the proposed tax is a business's dream come true; they get to tax virtually everything, all the time. Everyone except the ultimate consumer gets to claim credits back. Some income levels of consumers will get related through the personal tax system. This involves the record keeping nightmare company businesses will have to see all these receipts and be able to prove they are worthy to get their credit.

An example of how it will work is illustrated below:

Sales/Purchase Taxation on Tax Tax Sales/Credits	
Price Product/100	— \$7 \$— \$7
Manufacturer	\$200 \$100 \$20 \$7 \$14
Distributor	\$400 \$200 \$20 \$21 \$7
Retail Level	\$400 \$400 \$40 \$28 \$14

Ultimately the only tax paid is at the level of the consumer.

### The Accounting Level

A manufacturer's accounting entries would look something like this:

Sales	
Debit Accounts	\$100
Credit Sales	\$100
Credit GST	\$7
Purchases	
Debit Purchases	\$100
Debit GST	\$7
Credit Cash	\$107

GST Accounts	
Debit GST	\$7
Credit GST	\$7
Purchases	
Debit GST	\$14
Credit Cash	\$14

As you can see, the entries will seem strange on your balance sheet, they are all balance sheet items.

### Money For Nothing

You have also heard of the Taxable Sales & Tax Base (TSB) — for a while anyway! — Tax Charged on Sales. From this amount, you will be able to subtract tax paid on purchases (your Input Tax Credit), the remainder will be your Tax Payable (if it is positive), or your Tax Refundable (if negative). Inconceivable that you could claim refunds before you actually sold any product, if you are just starting up your company and are building inventory, or developing the product.

### Quick And Streamlined?

On June 1, 1990 the government released a "road map" for certain smaller businesses. Instead of keeping track of the tax paid on purchases and the amount of tax collected and then creating the net difference, "qualifying small businesses" can instead elect to a prescribed rate, which is less than 7%. However, there is no compensating deduction for the input tax credits, so the rate reduction is meant to account for the average gross losses by volume. Therefore, the reduction is simply calculated as the prescribed rate times gross revenue.

Qualifying businesses will still collect from their customers at a 7% rate but they will not have to setup the systems to track the input tax credits as they make normal inventory purchases. GST on capital purchases will still be accounted for in the "normal" method and input tax credits will be available for them. The "streamlined method" was conceived of for businesses in the food industry, where the GST is particularly complicated. For example, a purchase of six prepackaged pizzas is acceptable as just a case of six pizzas!

Note that you must determine which of the three methods (none, quick or streamlined) is most advantageous to your business.

### The Thought Police

There will be a release on the federal sales tax paid on inventories held for resale (see supply). Therefore, businesses with inventory must also maintain. December 31, 1990 is the deadline to report which sales positions they wish to opt. Note that you must be registered by January 1, 1991 to collect the sales tax. However, Canada believes you have a decent personal inventory system, they may not require you do inventory. The approved process for what constitutes a satisfactory inventory system has not been released at this time. The government has expressed an intention to track businesses which do not pass that step on to their customers.

### Taxable Terminology

Here is where a good tax book. There are three basic categories: Taxable, Tax Free and Tax Exempt.

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Taxation is where most of us will fall on the great unwashed. Almost all businesses producing goods or services will be taxable, as will be the real consumers. The fundamental difference between a business and a consumer is that the business will be able to claim credits (input tax) as a part of the process of creating their good or service. The consumer will not.

The first mistake will be basic groceries and exports. There will be no tax on the sale of these goods and the producers will be able to claim input credits back for purchases they made to create these goods. If you buy your weekly supply of eggs, it will not be taxable groceries, but if you buy a store package, it will be taxable credit a basic grocery store.

The second mistake will include doctors, dentists and essential retail. These people will not have to collect the GST on their services, but they will attempt to be able to claim credits on their purchases (the net effect is likely to be increased costs for doctors, dentists and localities), because they cannot claim the GST back on things they buy for their health services. In all likelihood, these increased costs will be passed through to the consumer anyway, although they may not be as high as if the GST had been included.

## Welcome To The Public Service

If you run a business that falls under the federal goods and services tax, you will join the ranks of government employees as of January 1st, and become a tax collector for the government. If you are engaged in commercial activity that results in tangible personal property being delivered in Canada, supply intangibles that will have their use or benefit in Canada, and real property located in Canada, or supply services and use in Canada, you will become liable to remit an all-inclusive sales tax.

## Taxing Is Everything

"When does the GST become payable?" you might ask.

According to the government's Section 148 of the proposed GST Act, payment is due to the government on the earlier of (A) the date the consideration is paid, or (B) the date the consideration becomes due. That date is determined by the date of the invoice, the day the supplier makes delivery or the day the receipt is required by agreement, whichever is earlier.

What if the invoice date that there will be payment precedes the receipt date? Well, after 30 days, if your customer has not paid you, you will have to pay the government early cash.

Interestingly, if you delay your invoice until the first of the month, you will not have to pay the government until the end of the month following the invoice date. On the other hand, you may be under pressure from your customers to invoice earlier, maybe 15th of the month, so that they can claim their credits in the month following.

## How Often Do You Have To Pay The GST?

Businesses with annual sales below \$50,000 are exempt from the GST system but may elect to be in the GST system. Businesses with sales below \$500,000 annually, can report their GST and are

likely, but may be required to make quarterly payments. Businesses with sales between \$500,000 and \$5 million are usually taxed the quarterly, but may elect monthly filing. Businesses over \$5 million in annual sales must pay their GST each month. The trick is that you can only claim your credits on the same basis as you are liable for them, so for businesses short financially, it may be advisable to file more regularly so you can get your credits more rapidly as well.

## What Does It Mean To Your Customers?

In most cases, the GST will just be an accounting headache. They will have to pay the GST for your goods or services, but then they will be able to get credits back as an input credit.

The real cost is going to be in changing your pricing systems to take into account what you owe the government, and what they owe you.

Another real is the base value of your money. The government has structured it so that your prices paid to the consumer are 10% (plus price paid to the consumer) plus 10% (plus price paid to the consumer), and yet they don't pay much interest if they are late in repaying you.

Higher storage costs may also be incurred, because your volume of documents may be larger. You will have to meet the current requirements of having all invoices for an year should become Canada Customs and Excise web to do an audit on your business.

If you are selling to consumers, there will be a spread of pricing used in the new era. Everyone will have to get used to the price being 7% higher, and asking whether the price tag includes GST or not.

## What Changes Will You Have To Make To Your Invoices?

One factor to consider for your accounting system is the need to possibly change your amounts or sub-invoice steps. The GST Act requires that invoices for the Input Tax Credits. These include:

Invoice Dates	10% required	10% required	10% required
Due date	required	required	required
Invoice date	required	required	required
Invoice date of GST	required	required	required
The date of receipt from the customer	required	required	required
The date of the invoice	required	required	required
The date of the invoice	required	required	required
The date of the invoice	required	required	required
The date of the invoice	required	required	required

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## Planning

Dealing with the changes resulting from the proposed GST for most businesses will require a number of steps. Start by establishing a framework for planning and implementing the GST. Set up a timetable of the activities, then assigned, who will be responsible and

what the reporting dates will be. Document the length of the approval changes and the costs associated with them. Talk to your accountant.

EW Macfarlane, C.A., is an experienced manager, taxation specialist, in the Vancouver office of Arthur Andersen & Co. Emil is responsible for the commodity tax practice in the Vancouver office and is working with the National GST group and Vancouver clients to analyze the effect of the GST on specific companies and advise on all aspects of the tax.

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## What Is It Going To Do To The Cost Of Computers & Software?



By Tim Patterson

### Magazine Subscriptions Will Be The First Hit

"The Goods and Services Tax (GST) goes into effect on January 1st, 1991—at the Toronto meeting to push it past the present Senate opposition and there are no delays now that Ontario and Quebec have agreed to combine it with their sales tax. The first impact was felt on September 1st, when GST was applied—on a pro-rated basis—to subscriptions

"Computer equipment and components already in hand will have paid the 13.5% PST and the 7% GST would be added on top. ... Revenue Canada is offering PST Inventory Rebates for all stock in hand at year end. It is up to the importer, distributor and retailer to claim this rebate and adjust the selling price accordingly on January 1st."

that entered into 1991. It is uncertain how effective Revenue Canada will be in enforcing the GST on U.S. magazine publishers.

### Magazine Tax Grab?

The tax has been the subject of many comments and criticisms. "The Toronto meeting is charged with a very sensitive task: to make the responsible Magazine Publishers or Federal Sales Tax (GST). The opposition claims it will increase the

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grade. Before the party ends, the non-affected goods 7% GST replaces 13.5% PST and, on average, will have a neutral effect—the specific foreign computer items are discussed later. On average that is a net tax that will bring in additional revenue to the tune of several billion dollars annually.

The GST is a Value Added Tax applied at all levels of the raw material, manufacturing, distribution and retail chain. Each level computes the 7% GST tax only once to recover the GST the difference between the tax charged to the next level and the tax paid to the previous level—so that the tax is not compounded.

**Value Added.** Taxes are levied on any country, including throughout Europe. Typical rates are in the 15% to 20% range with some countries higher (see the sidebar page). By most standards, the Canadian median 7% GST is modest, and better than that charged.

Once the GST is in place, future governments have a game that may lay a golden egg. Increases will generate higher revenue immediately, without countermeasures effort. There will be obvious temptation to increase the tax to reduce the federal deficit. Given the rapid foreign competition and the growing deficit, this may not be a bad thing. Although everything will move, increasing inflation in the short term.

## Computer Programmers Will Be Taxed

In the computer world, the GST will have mixed impacts. All services, including repair and maintenance programming, will immediately cost 7% more. Conversely, the cost of printed computer forms and other computer-generated items like electronic flyers, which have the PST added at the retail level, will drop by 6.5%.

## Effects On Hardware And Software

Changes in the price of computer hardware and packaged software will be studied and noted—depending on the country from the import and the retail price.

Take aggressively priced equipment like PC clones and lower-end printers. Both the component importer and the value added retailer work on low margins, often creating distributor and assembler margins. A computer with \$1,000 of imported parts could sell for as little as \$1,100. Duty at 10% on the import level increases the importer's cost to \$1,210, or \$1,980 if added on the GST of 7% to \$1,287 (\$190, in simple terms, your cost should drop 6%, or 6.5%.

There will be exceptions at the beginning of 1991. Computer equipment and components already in hand will have paid the 13.5% PST and the 7% GST would be added on top. While double taxation is not unusual in Canada, Revenue Canada, Customs and Excise, has made arrangements to avoid this situation by offering PST temporary refunds for stock in hand at year-end. It is up to the importer, distributor and retailer to claim the rebate and adjust the selling price accordingly on January 1st.

The automated government watchdog on price gouging is unlikely to have any immediate effect and in January it is up to the consumer to raise their 7% simply added to the December price by

refusing to buy—temporarily. A discount on sales the first week of the New Year should rapidly bring prices back on line.

Low-volume computer products and low-end equipment will face a different impact from the GST. The selling price of this equipment often set at what the market can bear. The market makers' manufacturing cost and wholesale cost may be high, both in their development and advertising costs, and to maximize profits. This can be particularly pronounced where the Canadian distributor is solely owned by the manufacturer.

In this case, after adjusting for differences in corporate taxes and any off-setting tax losses between the two countries, the manufacturer may support the price to the lowest price possible—in pay the lowest amount of PST—there point the profit from the higher mark-up back to the parent company.

For example, let's say a Macintosh 128K notebook computer could be imported at \$1,500, priced at \$3,000 wholesale and sold on the street for \$3,600. 13.5% GST on \$1,500 is \$203, while 7% GST on \$3,000 is \$210, an increase of \$67 or 2%. Alternatively, the distributor, in order to keep competitors, will lower the wholesale price to \$2,500 and pocket an additional \$200 profit, selling the computer with 7% more.

If you are in the market for such product you may be wise to buy before the year-end—in play the technology's price curve game and make a year-end computer buys the price down, say to \$1,800.

## Computer Books And Magazines To Be Taxed

Books and magazines are not subject to PST but the GST will apply, increasing their cost by 7%. This increase should be partly offset by the forthcoming higher Canadian dollar. However publishers and Canadian distributors have used the opportunity of an low dollar over the last few years to widen the gap between the U.S. and the Canadian list price. There were little movements to reduce this gap now the dollar is up. Once again, the consumer can take charge by choosing books with a reasonable differential, by buying at stores that offer a discount, or by ordering by mail from the United States.

After January 1st, mail-order costs will change. Revenue Canada will continue to collect duty and taxes on the landed price of goods from abroad. The 13.5% PST will be replaced by the 7% GST, making imported computer hardware 6.5% cheaper. However, importers and books will now carry the GST for an increase of 7%. One of the advantages of mail-order—and an company for local distributors that provincial sales tax is avoided. Technically you should count sales tax in the province on items brought in, but this is only collected on non-resident and major corporate purchases.

The provincial governments have been discussing arrangements whereby Revenue Canada would collect provincial sales tax at the point of sale on books and other software. There is no agreement as yet, but if it comes, it will wipe out the advantages the GST brings in hardware mail-order and higher printer power software and book imports.

After the year-end, the higher Canadian dollar, coupled with reduced taxes, will make mail-order look more attractive

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see the hardware purchases, but let the buyer beware, there are pitfalls.

### Effects On U.S. Mail Order

Several U.S. mail-order suppliers do not ship outside the continental United States, others add high shipping charges to Canada, while others no longer offer postal delivery. The mail-ordering postal service has advantages as a no-chicken-free loophole. Your package arrives a year downstream with no transit for duty and taxes. Reverse Canada informs us you may ship your items duty and tax-free into the U.S. without a return form (CDS-90) either free. After January,

if the policy remains, goods up to approximately US\$479 could be imported duty and GST-free.

Bookings are also included in UPS and Federal Express shipments. You have to supply the shippers with a power of attorney to allow you claim your goods, and you will have to pay the shipper the duties and taxes plus a surcharge, typically \$2 to \$30.

The commonly used UPS ground shipping does not include brokerage, which adds \$25 to \$40 to the cost of duty and tax. In all cases, you can go to the shipper's bonded warehouse over the airport and process the paperwork through Customs yourself, any savings

depends on how much you value your time.

It's usually easier in Canada to a potential problem with the majority of mail-order purchases. Only a few U.S. mail-order vendors—usually not the lowest-priced—have Canadian service arrangements. Most Canadian distributors will repair items personally requested—on their full labor and parts cost, a few will honor International Harmonized System parts prices are correct, allow full non-repair self-supported equipment at all.

Although most equipment meets both the UL and CUL electrical standards, some does not. There are slight differences in the UL and Canadian standards.

Using non-UL-certified electrical equipment could invalidate your fire insurance.

Telephone equipment sold in the U.S., including fax boards and modems, rarely carries Communications Canada (CCC) certification. Connecting uncertified equipment to Canadian telephone lines is contrary to CCC regulations (regulations that are not practical to enforce).

Returning merchandise for warranty repair can be a Canadian problem: packing the item, but leaving it unopened for inspection, taking it personally to the Customs House at 3011 Van Praeger, and completing a set of 115 paperwork. Otherwise you have to ship it and pay along with the shipping charges—often more, on sometimes both ways, it can take weeks or months to get the item back. My experience with mail-order electronic equipment has been good. One time did not work on delivery and, short of time, I mailed my own stamp and return charges to the Canadian distributor. Another item failed to connect after the warranty expired. The item was not imported into Canada—although similar models were—and the Canadian distributor could not repair it. I was upped it.

There is much to learn with mail-order books and software. However, the price differential on software rarely justifies buying in the States after taking the duties, premiums, taxes and shipping into account, particularly if the software is a popular item, often in sale here. Maybe the ease of importing keeps our price reasonably current since local dealers are importing the Canadian distributor and bringing software in directly from the U.S.

### The Damages

In summary, while Canadian selling prices can be severely set by the distributor and market, our after-market examination have been verified on the CCC impact on computer hardware and packaged software should be minor, on the range of 4 to 6% in the retail level. Books and magazines—including subscriptions—will increase by 7%. Mail-order costs from abroad will drop by 6.5%.

If this paper can be considered mail-order from the U.S., how to mail the possible risks. Advice, after-sale service and warranty support can be worth more than the few dollars saved. If you will benefit from the U.S., there would be few Vancouver computer credits and a host of range of products to see, buy—and have installed locally.

Tom Parkinson, P. Eng., is president of TPTC Transport Consulting Ltd., and has published over 200 reports and articles in his professional field of urban transit.

\*There is no duty on books, software, computer printers and equipment manufactured in the United States, however most U.S. mail-order equipment require sufficient quantities of imported components that 9.5% duty is charged.

\*Note that this 9.5% exemption may not apply to the border. Under present rules Canadian electronics is being treated in the U.S. as Mexico. Canada, Mexico and Mexico, but there are actually applying a no-duty regime, and collecting of duties and taxes on the border—however small. The charges may be added, but if you have your item, shipping it back on return-taking up pay is the duties may not be worth it.

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02-10

## SURVEY OF PC ACCOUNTING SOFTWARE

Accounting  
For The GST

by George Brown

"Many-faceted programs are essential capabilities, at the other end of the scale, you're dealing with a product which was designed by accountants."

— Murray Atkins of Vancouver/Vancouver Systems Inc.

If you run a business, you probably realize that the GST will introduce an increased level of complexity in your day-to-day operations. Because of this, many businesses that have in the past resisted computerizing their accounting system realize that now's the time to bite the bullet. Others may find that their current accounting software is not able to handle the additional complexity of the GST.

Before you dive headlong into the sea of automated accounting solutions, here's a quick look at some of the products that can help. While by no means complete (there are over 25 Canadian accounting packages), we have tried to cover some of the more popular packages in Canada. Please contact the companies for further information on their products and prices for the GST.

The growing necessity of accounting software has led to a segmentation of the market into three distinct categories, mid-range, and high-end.

The entry-level market has programs priced at \$250 or less and includes such titles as ACCPAC Bedford Integrated Accounting from Vancouver's Computer Associates and Tax-Buy Accounting from Tax-Buy Canada of Don Mills, Ont.

High-end accounting programs typically sell for more than \$2,000 for a complete system of several modules. Examples in the accounting software business in Canada are the ACCPAC Plus, which has a lock on the high end of the accounting software market. There are, as we shall see, several competitors out there trying to change that.

**At a Glance****—Low End**

Computer Associates' Bedford Integrated Accounting offers greater ease of use than any other package, but take a look at *Bedford 6.1* before you buy: it has the most functionality than Bedford without a compatible run in complexity or price.

**—Mid-Range**

In popularity, NewPlan takes the

middle-range crown. There are, however, plenty of other strong contenders. Consider that product training and support may be a package's most important features. Be sure to contact the companies to find out what they offer.

**—High End**

Much to the disappointment of the companies, Computer Associates has achieved overwhelming success in Canada with its ACCPAC Plus line of modular accounting software. Market surveys show ACCPAC Plus taking high with an 80% plus share of the IBM-compatible high-end accounting software market. If you've got an accounting, check out good that lie on the way. If you need a customizable system, there are a few accounting systems that come complete with modifiable source code, including SBT Database Accounting Library and Open Systems Accounting Software.

**ACCPAC**

Computer Associates, Canada, Ltd. (CA) has announced a plan of upgrades, updates and GST planning guides designed to ease the transition for businesses using its ACCPAC family of accounting software solutions. The plan is designed to help existing users and new users of CA's accounting products prepare for and successfully implement use of the federal government's new tax structure.

As the first step of the plan, CA will send a booklet titled "Accounting for the GST" to all registered ACCPAC users beginning October 1990. The booklet will provide tips on preparing for the GST, answer commonly asked questions, and explain the changes in specific ACCPAC GST product upgrades.

Computer Associates will also provide a transition utility that will allow ACCPAC Plus users to globally update their data with GST information prior to the GST start-up date. That will ensure that their users are able to switch as quickly as possible to the new tax structure when it comes into effect.

CA will also release GST upgrades for ACCPAC Plus, ACCPAC RPT Accounting and ACCPAC Bedford (PC/PS) and Macintosh) to provide additional GST functionality.

"Our goal is to simplify the GST transition for businesses. By providing increased GST functionality in our products as well as software tools and documentation that can be used in conjunction of the GST start-up date, we're taking large steps in that direction," said Ted

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Comiskey, president of the Micro Products Division for Computer Associates.

"Our approach is designed to benefit current ACCPAC users and potential users alike," said Comiskey. "We are encouraging businesses who are thinking about accounting their accounting to purchase ACCPAC as soon as possible so their systems can be up and running when the GST comes into effect."

Accountants specializing in multi-computer consulting are giving similar advice to their clients. "Accounting for the GST is going to be a much bigger job than many businesses seem to realize—it will require major changes to most busi-

nesses' accounting procedures," said Ross Lagace, national partner of microcomputing services firm Dekaba & Touche.

"Using a computerized accounting system to track GST input credits and receipts will reduce the effort for most businesses. However, business planning to automate their accounting systems for the GST should begin doing this now."

The GST applies for each ACCPAC Family product line will be reviewed prior to the federal government's implementation date (currently proposed as January 1, 1991). GST upgrades will be provided

for users of ACCPAC Plus Accounts Receivable (AR) and Retail Invoicing (RI).

The ACCPAC Plus AR GST enhancements will allow tracking of a GST portion of the invoice amount and handle multiple recurring charges. A transition utility will be released for other ACCPAC modules allowing users of version 5.5 to import GST information on such as customers and inventory tax status and item pricing modifications while continuing to operate within the current file structure.

When the GST comes into effect, they can simply export the information from the utility into their working (live) database and thereby function immediately

within the new GST tax system.

"Use ACCPAC Plus more effectively have very large databases," said Comiskey. "The business ability is designed to save many hours of updating time that these users would otherwise experience preparing for the GST. The fact that this new file structure will occur virtually overnight makes this saving an essential tool for ACCPAC Plus users."

In the ACCPAC Plus Accounting line, GST upgrades will be provided for the AR and Inventory Control (IC) modules. The upgrade to AR will allow groups to allow for multi-level taxes, including the GST. This information will also be included in the product's reporting capabilities. The IC upgrade will allow the user to define a liability account for GST paid on inventory receipts for proper tracking of the input tax credit.

### GST Upgrades from CA

The upgrade to the ACCPAC Retail product will replace the GST system with the GST system. Data entry screens and audit trails will be modified to include the GST tax structure. Support for maintenance subscribers will receive the upgrade for all of these GST-related products. Users who purchase these products between August 1, 1989 and February 28, 1991 will also receive free upgrades. The usual \$15 handling fee for upgrades to these items being waived for the GST upgrade.

ACCPAC Plus 5.0 or 5.1 registered users who purchased the product prior to August 1, 1989 may upgrade, receive the same upgrade from the upgrade and will receive technical support for 12 months by purchasing SupportPlus for \$200 per module (\$175 per module for the upgrade only). Registered users of product product may upgrade by purchasing SupportPlus for \$150 per module. All ACCPAC Plus AR, IC and IC users who receive or purchase GST upgrades will receive the GST database and utility. ACCPAC Plus Accounting AR and IC users who purchased the product prior to August 1, 1989 can receive the GST upgrade, from upgrade and will receive technical support for twelve months by purchasing SupportPlus for \$150 per module (\$125 per module to upgrade only).

ACCPAC Retail Integrated Accounting or ACCPAC Retail Supply Accounting registered users of English or French version who purchase the product prior to August 1, 1989 can receive the GST upgrade, from upgrade and will receive technical support for twelve months by purchasing SupportPlus for \$200. ACCPAC Retail users interested in purchasing SupportPlus can do so by calling the Computer Associates Upgrade Department at (800) 735-2543. Contact: John Schmitzer (800) 735-2522.

### ACCPAC Easy

Although ACCPAC Plus dominates high-end accounting software, ACCPAC Easy has made a strong competitor in the mid-level accounting market. Retail Integrated Accounting (RIA), now owned by none other than Computer Associates (it now can't be lost, now, yes, and the day after tomorrow, it can't be lost), is the first of the new RIA. It's a new accounting program. Although it's priced aggressively at just \$95, ACCPAC

### Sales flounder early



### Sales flounder early but surge in 2nd half



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take their accounting system to match their needs.

Originally developed by SST Corp., of San Jose, California, the SST Corporate Accounting Library comes with source code written in Adobe-Type II office programming language. That means that you can rewrite the code of the accounting program to change its operation. SST has modified the programs to become suitable for the Canadian market by including support for the full and sales tax calculations used in Canada through the month.

These days, completely custom-written software is too expensive to be affordable for most companies. Customizing

is also time-consuming, so you want the programmers to write the software. Additional time is required to test and debug the finished programs to ensure that the software operates properly.

SST is positioned as an affordable middle ground between the unaffordable package and completely custom software. You can start with the code for a simple standard accounting system, and, with a few hours or a task force, tailor your own accounting system.

Using SST as a base, tailoring can be accomplished quicker and more economically than a completely custom solution. Furthermore, programmers ex-

perienced with its popular office programming language are relatively easy to find.

Running SST in the source code version can be rather slow. So, once the code has been modified to meet your needs, it should be compiled into object code. The object code version cannot be further changed, but a backup of the source code can be retained for any future release events you wish to make.

If you don't feel like programming yourself, SST maintains a directory of dealers and consultants across the country who are familiar with SST and can change it for you. There is also catalog of dozens of ready-made enhancements

prepared by third parties for corporate applications, such as sales/inventory. SST runs on many different hardware platforms and operating systems including MSDOS, Macintosh, and Xenix. Soon a version for Digital Equipment's VAX microcomputer will be ready.

A wide range of accounting functions is available. From popular capabilities such as general ledger and accounts payable to business-related capabilities such as sales order, purchase order and inventory modules. Modules cost \$975 in the single-user version (\$999 for Canadian payroll), and \$990 for the multi-user version for either local area networks or the Xenix operating system.

The recently released Version 6.2 adds a number of capabilities, including more extensive inventory options. For example, you can now obtain monthly product sales history for the past 18 months.

MSB president Ray Manocha complains that most accounting software vendors make a "one-stop, ABCING recommendation." Not surprisingly, he would rather they suggest SST. He had a plan to allow current ABCING users to trade in their software for SST will be completed later this year.

MSB Inc., 171 Eastview Avenue, Toronto, Ontario M2M 1H6, (416) 585-8880.

## BCS: Informatic Software

BCS (Business Control Software) by Toronto-based Informatic Systems is ideally suited for businesses that operate in foreign parts of the world. Informatic accounting programs can accommodate transactions in up to 15 different foreign currencies. Customer accounts receivable listings and sales analyses can be reported in either the organization's or in Canadian dollars.

BCS provides a lot of power and requires a substantial investment of time to learn to use all its capabilities. Its target market is the small to medium-sized company with demanding accounting requirements.

BCS is definitely not for accounting neophytes nor for start-up companies. The system has unusually large capacities in most areas. For example, the inventory product code can have up to 25 alphanumeric characters, whereas most competitors limit you to 10 or so. In addition, you can use another 60 characters to describe the product.

Many of the modules have built-in graphics capabilities. For example, the product-inventory module allows you create a bar chart to compare actual results to budget for every month of the year. The price of BCS ranges from \$495 to \$1,495 for most accounting modules in the single-user version. That's a little pricey, but it represents good value given its capabilities. The multi-user version costs no more than \$90 per module for each additional user workstation.

Informatic Systems, 1899 Finch Avenue West, Suite B20, Toronto, Ontario M3J 2V1, (416) 585-8450.

## NewViews

Currently, the NewViews accounting system (\$1995) from Toronto's QTV Page Associates Inc. is the only selling multi-user program in Canada. The product, designed for the accounting requirements of professionals such as lawyers, architects, engineers, and accountants, now has an updated set of

# TO COMPUTERS 273-4700

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**SUMMATION** is a manufacturer of software for business. We have thousands of happy, satisfied users because we support them.

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financial reporting models and procedures called WY100BELL (100B) that estimates cost entry, billing, and reporting.

Timsoft can accommodate up to 10,000 clients with as many as 100,000 projects per client. Time and expenses for 1,000 professionals can be tracked as the system. A different hourly billing rate can be established for each service provided by a professional in each client.

You limit up to 30 characters to describe each service on an invoice. Additional information can also be entered. However, this cannot easily be printed out on a bill. This could be a limitation, particularly to professionals who want to include a detailed record on the invoice of all services provided.

NetVision has been successful in this part of the small- to medium-sized capabilities, but the Timsoft system has better up controls. If you'd like to see a more detailed view of a movement client account, you will have a one-dollar on-call payment. Separate client trust fund accounting is provided for law firms.

Richard Marchese, office accountant firm Marchese and Associates, is the "Manager" of Jays's entire Computer and Accounting Information Network. In his review of NetVision for that network, he states, "Although client account capabilities were more than adequate for all but the very largest professional firms, the reporting capabilities were" especially strong. For example, queries are prepared one at a time. You view the account details on your screen as it then decodes any you want to prepare a bill. This could be tedious and time-consuming if you have more than a few dozen active clients. More capable time and billing packages allow you to set overall criteria for billing purposes, such as all accounts with a working-hours balance greater than \$500.

Due to the design of the NetVision accounting system, you have a great deal of flexibility in modifying the program. For example, you can change the calculations and reports of the Timsoft program by adjusting the "procedures" written as Page's proprietary computer language. However, this should not be attempted by novices; instead, previous programming experience.

Murray Aron of BusinessVision Management Systems Inc., the manufacturer of computing product Business Vision, calls NetVision a "major ground lodger." However, he says, "It is not mainstream and you do need to have an extensive knowledge of accounting to use the product. They don't have an order entry database and most businesses

are in the business of taking orders and selling something."

The current version of NetVision (1.15) began shipping in May, 1990. As with previous NetVision updates, users are required to purchase the newest version 1.15 to maintain their current support privileges.

Q.M. Page Associates Inc., 1 St. Clair Avenue West, Toronto, Ontario M4V 1G3, (416) 593-0477.

### BusinessVision II

BusinessVision, originally introduced in October 1987, is exceptionally strong in the preparation of bills.

The latest version adds functions for payroll and sales analysis to the accounting options. In addition, there are numerous minor enhancements to the previously available functions of general ledger (including job cost), accounts receivable, accounts payable, inventory, and order entry and billing. The basic program with all functions lists for \$995 and runs on the IBM PC and compatible microcomputers.

The optional network upgrade costs \$300 and allows users to use one to access the accounting data. It allows up to 5 database levels for a network, as well as volume discount levels for products.

The package gives transactional immediately upon approval. Thus, the time that your accounting records are always up-to-date. This is one of the small business to closely monitor the amount of cash on the bank, for example. However, with this online type of system, you may need to wait a few seconds until your computer is completed before you initiate another transaction. Large companies with many transactions may probably be better served by a program which "batches" transactions, accumulating them until they can be posted all at once.

The automatic posting feature of BusinessVision allows you to set up automated posting accounts for many items, such as product sales. This means that you don't need to consider the accounting details and enter with each sales transaction. The program will calculate the entries and post them automatically. However, this automatic posting can be overridden if you want to post on exception.

Unlike some other programs which require you to print out most of your information reports, BusinessVision has good online inquiry capabilities. Its screen orientation allows you to view important information on your screen without the need to run pages of reports.

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events are either optional, giving you critical information beyond that which is absolutely required.

Operations of the system are somewhat unconventional. It uses the shift and quarter-inch key to control menu movement. This is different from most other programs which use the escape key to back out of operations. However, sophisticated users familiar with advanced tablets should pick up operations quite enough.

There have been updates over which method is best suited for processing accounting transactions on online systems which posts entries immediately, or a batch method which doesn't post transactions until after you check them. With Kenner 1989 you can use either method. The standard program is set up for online processing but a batch processing program is available.

A point-of-sale option is available for retailers. This prints out a sales invoice for customers on the spot and controls a cash drawer.

The instruction manual and input screens were obviously installed by someone whose mother tongue was not English. However, this is one of the few systems that a major firm in the accounting industry quite appreciates. According to Donovick, a review of the manual is planned.

Lotus Development Corp. needs't worry about still competitors from the Kenner Cash spreadsheet. It features adequate, but unimpressive, basic spreadsheet capabilities. However, Calc is integrated with the accounting module in a remarkable degree. The one point not covered is that as account descriptions and amounts directly from your accounting records and develop a cash flow forecast very quickly.

Kenner 1989, CP 128 max. C. Montreal, Quebec H2L 6L2, (505) 425-2252

### Open Systems Accounting Software

Toronto-based accounting software developer Softpoint Technology Inc., a subsidiary of 126-1269 Ontario Techologies, distributes the accounting software of Open Systems, of Eden Prairie, Minnesota. There are twelve, or the high

end Open Systems Accounting Software (OSAS) and the multi-range hierarchy line of business software.

OSAS Version 4.0 is the latest version of a remarkable line of accounting software. It was first sold in 1979—the same age of personal computing. Thirteen years later there are 100,000 installations of desktop workbooks, with an estimated 10,000 in Canada.

The new version includes a number of refinements designed to make the system more "operator friendly." You can now create custom reports online at the touch of a key. Online help is available within most other accounting systems, but Open Systems adds a new—you can change the help messages to customize them for your own operations. For example, you might add references to your company's procedures. This is a rare and potentially quite useful feature.

Consistency is one of Open Systems' strong points. It's one of the few accounting systems that comes complete with modifiable screen code. Softpoint Accounting Library from Toronto's MSK Inc., is another example.

The source code is written in Business Basic Extended (BBE/TL), a popular computer language. "With great portability that no other package really has," says Softpoint president Michael Cooperstein, "it opens across 15 different hardware platforms."

OSAS comes in different versions for both the IBM PC and Unix operating systems. The DOS version also supports multiple users on a local area network.

Programmers who know the BBE language can change the appearance of screens, reports, and the information prepared by OSAS. Due to the ease of modification, there is a substantial library of specialized vertical applications programmed by third-party developers. The large number of add-ons for OSAS is comparable to those available for the top-selling AGEKING Plus accounting line.

The standard modules of OSAS include more than a dozen covering all common accounting areas such as general ledger and accounts receivable, as well as more specialized applications such as time and billing for professional practices, and job costing for construction.

Although the extensive reporting capabilities of OSAS have been enhanced, a full can't track Canadian federal sales taxes. Nor is a Canadian payroll system currently available for OSAS 4.0.

There will some change, according to Cooperstein. "There are a couple of developers who have been working with the production a long time, for at least a few years. They are right now taking 4.0 code and converting it, making new account things like P&L, things like P&T, and all the little changes like postal code instead of zip. The mapping seems like that. We started getting out a Canadian version of the modules that are affected.

like order entry."

The accounting functionality of OSAS has also been increased on various U.S. For example, sales commissions reporting has been improved, and new new get expanded descriptions for accounts receivable. Consolidated financial statements can be prepared much easier in the general ledger. Journal entries can be set up to automatically reverse in the next fiscal period, useful for handling multiple accruals.

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lack of digital audio), test-to-speech synthesis, and "the inimitable Dr. Minton," sure to be a hit with anyone unfamiliar with this.

The Sound Master is compatible with the Add-on card (also an IBM main option for the PC), which is well-supported by various games and other programs, and even has another (optional) 10 voice (2/MS voice synthesis) chips (you can't use either PC standard supported by Game Master-compatible software). Unfortunately, the MIDI feature of the Sound Master requires an optional MIDI Connector game which is not compatible with the Roland MPU-401 (the dominant PC

MIDI interface standard). Nevertheless, Sound Master represents a tremendous value for the PC owner.

Try samples could not be found in places like Radio Shack or department stores for less than \$100. Of course, a few years later, CD's and Digital recordings have become commonplace in the record industry and are in great demand. Truly, although the specific technique of Digital Sampling may not be well-known to many, there is little doubt that the technology has reached its end of its.

Most of the current generation of electronic MIDI instruments are a tech-

niques where a set of 16-bit digital samples are stored "onboard" in ROM (Read Only Memory) chips. The instruments typically include the ability to run four or more of these complex waveform "building blocks" together, and usually add reverb, chorus and/or other digital effects/spatial effects to enhance the resulting sound. The top manufacturers (Roland, Korg, Casio, Yamaha, Kawai, Peavey, even IBM players) Yamaha, all feature this type of "samples in ROM" technique, mostly because digitally recorded waveforms result in more realistic sounding instruments.

Richard Goye is now a company that is

approximately pursuing the "computer desktop" market. Their edge is in its integration over the popular MIDI interface, success of the finale and has been except for volume and power, and especially in a hands with an on-screen MIDI controller keyboard (either the PC-100 or the new velocity-sensitive PC-100) and software for all popular computers.

That was born the "Desktop Musical System" featuring the C64-100 for Atari, Mac and Amiga computers, and the D64-100 sound card for IBM PC/XT and AT machines. The music does the same sound capabilities as the MIDI, and while it, they can play right against your own a rhythm part under computer control. For those wishing to explore "Desktop Music", the Roland systems are necessary, yet complete plug-in play products.

## The Next Generation

When Newkirk, one of the founding members of Apple, was ousted from that company in a power struggle in 1985, he started a new company to create a "next generation" personal computer workstation. That company became NeXT Inc., and their first product, the NeXT Workstation, was announced in October 1988. Because of its appearance, it became known as the NeXT cube, and among its many innovations, it features what is simply the best material sound capabilities of any computer. The reason for this is a 16-bit sound processing chip called the Motorola 5600 DSP (Digital Signal Processor). (For more details on the NeXT, see page 58 of this issue.)

While it is possible to add a DSP to a Macintosh, Amiga or Atari (I have not yet heard of an Amiga-specific DSP solution), this development adds into knowledge because of what he calls the "next generation workstation" effect. If a feature is not standard equipment, the developers will support it. Therefore, a NeXT cube comes with, in standard equipment, digital sound input and output capabilities, and a complete set of "sound bar" features to support MIDI and the DSP's sound capabilities. (Especially, future Macintosh will also include digital audio input as standard equipment.)

The output of the DSP is stereo, 16-bit, 44.1 kHz, at a 16-bit CD-quality, although the standard microphone input (currently used on the cube as "voice mail" for its integrated e-mail system) is sampled at only 8 bits, in order to save memory and disk space. (Although you wouldn't think that should be too much of a problem, considering the NeXT cube comes standard with 16-bit RAM and a 200MB optical disk drive.)

Already, the NeXT cube has an impressive array of DSP-related tools, programs and peripherals available, including a full 16-bit recording option. NeXT is reported to be studying other possibilities for release, possibly in some of the full, including a high-end 640x480 hi-res color machine, and a three-card model and to resemble a power line.

## Add-on Digital Sound Processing

Although not standard equipment, Digital Sound Processing (DSP) hardware and software are available for the Macintosh or Atari computers called Sound Tools.

While not cheap (it's over \$1,000), consisting of the Sound Accelerator DSP card,



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audio input and Sound Designer II software adds about \$4000 to the cost of the computer), with Sound Tools, an Apple III, IIx, IIc, IIcx, or Macintosh computer can digitally record and manipulate the future of music, with all the finesse of—and better quality than—a fivefolded.

A Sound Tools-developed compressor can record direct to disk, approximately 200 kilobytes of space per 10 megabytes of hard disk space. Seen in this light, Sound Tools represents an exceptional value for serious producers work. (A low-cost \$599 Sound product called AudioMedia is also available for the Mac. Oriented toward the professional market, it is able to add proprietary features to HyperCard stacks and other Macintosh production programs.)

Of course that Macintosh 5000 and their new 5050x model, dubbed the 5000x, served the role of a standard DSP's available for 80386 machines, an AT-bus board is available from Voice Processing Corp. in Cambridge, MA, consisting of a Texas Instruments TMS320C25 DSP. This 5000x system has the ability to recognize "yes," "no," and other words through a voice-recognition filter.

DSPs can be found in products like compact disc players and digital video-type players, and can be widely applied for telecommunications, sound and image processing.

## The Sounds Of The Future

Technological excitement has led, too, the impact of DSP technology is starting to be heard...

Although many manufacturers prefer to not proprietary ideas because each company has some wants to be specially a winner to build, Panny Electronics, an American firm best known for their stereo games and modems, has recently come out with a hardware known as the DTMF-D based on those other than the 5000x chip. Being software driven, the DTMF-D is designed to be "operational" and affordable.

It is likely that more companies will take this approach, further blurring the distinction between computer and musical instruments.

## SHAREWARE SHELF

### Shareware for Windows 3.0



Organizer for Windows 3.0

Programmers distributing their software via the shareware marketing network have updated their Windows products and a multitude of new utilities have sprung onto the market.

### Telecommunications For Windows 3.0

Data Graphics of Seattle have updated their excellent telecommunications application Windows. Designed for Macintosh, Windows operating environment (V.32bis B), Windows will perform data communications functions while other applications are active.

Designed for Windows 3.0/Windows 3.0x, Remote Communications 3.0, Quick 3.0 and ASCII file transfer protocols will full background operation. Windows users complete with a script language with Tools Made debugging and a Script Scheduler allowing pre-programmed connections up to eight script files at designated days and times.

V.32B and TTY Terminal Emulation and Data ASCII-BBS support server-to-server terminal links from GEM to ASCII character sets. An online help file and the shareware user manual allow instant access to general help and script command topics.

Windows provides features supported by the Windows environment, such as transferring the contents of a clipboard from one computer directly into the clipboard of another, including hard graphics, bitmaps, images (from Paint), text from Notepad, any format document placed on the Clipboard. You can remove a Screen Saver from the Clipboard.

Windows/Macintosh/Macintosh Windows V.3 or 3.0x/AppleLink compatible version.

### Organizer for Windows

Organizer is a Personal Information Manager that looks and feels exactly like a diary and is designed for Windows V. 2 and 3. Its simplicity is that there are no unnecessary file names—you build and add them as you require them. Organized like pages like and features that click open to next page. It uses a Windows-native system to manage dates and associated personal information that you enter into that diary.

Organizer supports "to-do" list and personal planning, business contact, appointment management, and project management. You can create inter-linked calendars and multiple diaries. Written by Greg Clark (B&B Software), Organizer is recommended for ALL computers with at least an VGA monitor and a mouse.

Good Shareware is the owner of SH.COM Services (854-0094), a company specializing in shareware products.

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## EVENTS

A Decade of the PCCFA  
and Personal Computing

by Larry DeRite

This piece goes to the twentieth anniversary of the first personal computer fair held in the Vancouver area.

## 1980

In the summer, the Apple II C Computer Society decided to hold an event that the society's non-Person members could attend. Somebody suggested that other personal computer users' groups might be interested in participating. Just one week later, Vancouver's first personal computer fair was a reality.

This first fair, subtitled "The B.C. Personal Computer Fair," was held on a beautiful August Saturday at the University of B.C. All the local personal computer user groups were there, as well as a dozen commercial exhibitors. A number of local groups gave talks on various computer-related topics. Over 1500 people showed up for the fair. The talks were at the time more unorthodox. The entire atmosphere presented itself half an hour before the scheduled end, when a power outage struck, bringing a night-permanent end to a hectic day.

With the success of the first fair, the organizers conceived the "Pacific Coast Computer Fair" and formed the Pacific Coast Computer Fair Association. The members of the PCCFA, were all members of user groups and took great pains to ensure that the focus of the fair was on individual computer users.

## 1981

The Osborne I, the first "portable" computer, was released. Also announced that year was the first IBM PC. The computer made joining IBMWorld and about the IBM environment. "Whether or not it will have any effect on the microcomputing industry remains to be seen."

That year, the computer fair was expanded to two days and was moved to the Reform Square Midway Centre. The new site allowed a larger speakers' program and more space for exhibitors. Attendance was double that of the first fair and the organizers chalked up another success.

## 1982

Commodore shipped the first Commodore 64. Lotus introduced 1-2-3 for the IBM PC. Tandy announced a J1400 1-Megabyte hard drive for the T1020 Model I and II.

The 1982 Pacific Coast Computer Fair featured several new user groups that had sprung up to support the several computers. The computer fair program included a line of local computerized bulletin boards—all use of them.

## 1983

1983 was a hectic year in the microcomputing industry. Commodore 64's and Apple II clones were selling like hotcakes. The Apple IIe, IBM PC/XT, Compaq Portable and T1020 Model 100 appeared. On the negative side, Osborne went bankrupt, IBM announced the PCjr (later in its first major failure in the microcomputing market place), and Microsoft announced Windows (which would not ship for two years).

1983 also saw some fundamental changes in the direction of the industry as microcomputers to gain widespread acceptance in the business sector.

The 1983 Pacific Coast Computer Fair attracted nearly 3000 and drew many



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almost solely commercial booths. The speakers' program included microcomputer pioneers George Morrow and Bill Goodhart, and PC World editor Andrew Fliegelman. With the profits from previous fairs, the PCFA established annual bursaries for computer science students at UBC and SFU.

After the amazing success of the 1985 fair, the PCFA began work on an even bigger event for 1986.



## 1984

Unfortunately, 1984 was also the year of the Great Recession in the personal computer industry. When computer manufacturers such as Atari and Commodore were hit particularly hard, funding the downtown glamour, Apple released the IIxk Macintosh, IBM unveiled the PC AT, and Hewlett-Packard introduced the first LaserJet laser printer.

The 1984 fair celebrated the tenth birthday of the Atari 800, the first microcomputer available to the general public. The speakers' program featured Les Solomon, the technical editor of Popular Electronics, Apple co-founder, Steve Wozniak, Bill Goodhart, founder of the Byte Shop stores, Paul Turville, Macintosh software developer, Andy Horvick, and one of the original shareware authors, Bob Wialata.

Despite the optimism of the organizers and the quality of the programming at the fair, the number of commercial exhibitors was only half that of 1983 and attendance was down, too. As a result, the 1984 Pacific Coast Computer Fair, although an "artistic success," was something of a financial flop.

## 1985

The computer industry began a slow recovery. Commodore announced the Amiga, and Atari announced the ST. The Macintosh, joined with the Apple LaserWriter, got desktop publishing rolling.

First-time speakers at the 1985 fair included Apple's Manager of Human Interface, Bruce Tognazzini, and the author of PC/286, Jan Gunten. An overflow crowd packed the Harbour Square rooms to see Western Canada's last demonstration of the Commodore Amiga.

The organizers of the Pacific Coast Computer Fair decided that a new direction was needed for 1986. Therefore, instead of a large computer fair, two smaller events were put on.

## 1986

In January, the PCFA's first computer swap meet was held in a hallway at SFU. It seemed that people must have been waiting for just such an event, because many showed up with some of the most amazing computer equipment ever seen.

In the fall, a larger swap meet was held in a Burnaby high school. This event also included a small speakers' program and displays by local computer user groups.

## 1987

In 1987, the celebration swap meet and computer fair was moved to the McPherson Centre, where it has been held ever since. Despite changing commercial needs, since 1987 the computer fair has grown in both size and attendance. In 1988, there were over 60 commercial tables, exhibits by a dozen computer user groups, and almost 2000 visitors.

The last decade has seen the maturation of the microcomputer. Where once memory sizes were measured in kilobytes, they are now measured in megabytes. Cassette tapes have given way to floppy disks, which have given way to hard disks, which have now given way to optical disks. The market has gone from being a niche curiosity to an essential part of many personal computer systems. And personal computers have gone from being novelties to being integral parts of many people's lives.

Over the same period, the Pacific Coast Computer Fair has also undergone many changes. Yet, the basic philosophy has remained constant. The Pacific Coast Computer Fair was created by computer enthusiasts for computer enthusiasts and the focus continues to be on serving the individual computer user.

## 1990

The 1990 Pacific Coast Computer Fair will take place October 26th, at McPherson Centre. It promises a wealth of information, bargains, and just plain fun.

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## MS-DOS SOFTWARE REVIEW

### DESQView 386

By George Sklar  
Product: DESQView 386 V. 3.0  
Publisher: Dynamic Office Systems 190  
Pine Hollow, Santa Monica, CA 90405,  
Phone (310) 388-0700  
System Requirements: Processor: 80286-  
based PC & IBM PS/2, PC and PS/2 with  
80286-based boards; Memory: 800Kbytes  
240 total memory (not 256K); DESQView  
386 (DOS) memory manager 386 to 386;  
Display: Monochrome, graphics VGA, EGA,  
VGA; Resolves: Graphics/graphics PC/DOCS  
3.0 4.0; MS DOS 2.0 3.0 Software: MS  
PC/DOCS and MS-DOS; Operating systems:  
specifies Windows ( 3.11 ) and OS/2 1.0  
3.0; 80286 32-bit software compatible with  
the Quarterdeck®'s Top Virtual Control  
Program Interface Specification  
Price: \$20

Of interest to all MS-DOS users. Features multitasking, multi-windowing memory management.

#### Overview

DESQView 386 allows the user to set up three 80286-based machines as a multitasking, multi-windowing system using DOS and running DOS applications. Each window is a virtual DOS machine which provides protection—when an application crashes it will not crash the other windows. DESQView 386 also comes with QMM386, a memory manager which allows you to fine-tune your 386 to use all your available memory.

#### Set Up and Ease Of Use

DESQView installs with a simple setup program which copies the appropriate program into your hard disk and modifies the CMOS/SETUP file to run QMM386. Once DESQView and QMM386 are installed, they must be booted to become permanent/loadable.

The fine-tuning step is a great amount of time. Basically you must set all programs and all peripheral devices and then you look at a QMM386/SETUP file to run QMM386. Once DESQView and QMM386 are installed, they must be booted to become permanent/loadable. The fine-tuning step is a great amount of time. Basically you must set all programs and all peripheral devices and then you look at a QMM386/SETUP file to run QMM386. Once DESQView and QMM386 are installed, they must be booted to become permanent/loadable. The fine-tuning step is a great amount of time. Basically you must set all programs and all peripheral devices and then you look at a QMM386/SETUP file to run QMM386. Once DESQView and QMM386 are installed, they must be booted to become permanent/loadable.

You also have a means drive, disk cache and network driver as well as high RAM. This gives you 256K of standard RAM. Without DESQView, with all these drivers a standard RAM, only had 486K. DESQView is a simple program to use once the set-up program has been installed. It is simple to windows in and out of programs. The hot key (ALT) can be changed.

#### Documentation

The documentation is complete and quite easy to read. You get quite a volume

of little books, one for each part of the program. One thing I found about DESQView is that you need to use it for two to three months before you can appreciate all the power of the program. Also, you need to get used to a multitasking, multi-windowing environment before you can realize full benefits. If you are used to a standard DOS environment, you get used to how it runs and how you get around the features. For about the first month, when I wanted to switch from one program to another, I would not use them to go to another.

It took about a month for me to get used to simply jumping to another program. For this reason, you will find yourself referring to the documentation for quite some time after you install and start to use the program. This is actually one of the programs I use which I refer back to the documentation.

#### Error Handling

In an environment, even though it is tough, to say the least, if you set up, you have to set up how to reset a window and how to reset the whole system. The default way to reset a window is Ctrl+Alt+Del. When an application program fails within the window, you reset the window as if it was a DOS machine.

This is quite nice when first setting things up because if you are not careful at your set-up, you can have a lot of conflicts. After I had many conflicts, but once the system was set up to my liking, there were no more conflicts that would normally occur with standard DOS.

One limitation which is of some concern to me is the lack of record and file locking. When you are in a multitasking environment, you should have record and file locking.

For example, let's say you are working on a document in desktop publishing and you are using a word processor to maintain the text. You may have both programs loaded to perform your work. With DESQView, this is a snap. However, you must be careful to load and unload the text file each time you switch from one window to another, or else the changes are not transferred. If there is proper record and file locking, the system will force the loading and unloading of the text file so no possibility of errors exists.

#### Conclusion

DESQView is a very powerful program. First use DESQView when you install MS-DOS. There have, in some ways, been a lot of changes since then, and in some ways there have been no changes. The main screen and basic operations have not changed. When I first started to look at this version, the first one off. Much in my mind, I found there was a lot more to this version than version 3.0 ever had.

If you have an 80286-based machine with a good amount of memory, you are not getting into the profitability and power that you can achieve is capable of.

George Sklar is president of DES Software Review Corp., a White Rock company specializing in software reviews. For information about having your MS-DOS software product reviewed, contact George at (604) 278-2177.

## PUBLICATIONS

**2000: The Hacker Quarterly**

By Barbara E. McMillen & John P. McMillen

**Publisher:** 2000, P.O. Box 760, Middle Island NY 11953-0760. Telephone 516-751-0600. Online: 2000@well.it.cornell.edu  
**Price:** \$48 Domestic Mail: \$50 abroad  
**Rating:** 3.8 (on a scale 1 = lowest to 4=highest)

**Hacker Press:**

At a time when the word "hacker" is much in the news, many may wonder what exactly a hacker is. There are, unfortunately, many definitions of hackers, ranging from those which portray hackers as cyber-bad guys committed to unethical activity (e.g. "A hacker is any person who derives joy from trespassing on someone's facilities.") — *See Hacking* to those which portray them as techno-heroes committed to building cool cybernetic systems.

One thing no which all will agree is that hackers are concerned with technical information computers and computer networks. This type of information is easily found in the establishment computer press, which tends to address end-users, industry analysts and professional developers rather than hackers. Even Dr. Gould, long known as the most technical of magazines, is aimed at the professional programmer rather than the hacker.

Hackers, however, do not have to be totally disreputable. There is *Hacker Quarterly*, a

magazine with a circulation of approximately 2,500 (1,500 subscriptions, 1,000 non-subscribers). Edited by Kenneth Goldstein, a computer of bulletin board systems such as the WELL, (Whole Earth 'Lectronic Link), and written by a group of persons identified as John Deeks, The Flap, Long Lady, Kate Carter, Diana Swickman, Thomas S., The Jabbler, and Paul Slater, 2000 provides technical explanations (often with diagrams and information), news of interest to hackers, a lively letters section and editorial comments on issues such as the recent Secret Service's Operation Sandstorm action of hackers throughout the country. Founded in 1981, 2000 currently is the size of the Playbills that theatergoers are familiar with and is presented on a slick cover and runs 46 pages. There is no advertising (other than for its own subscriptions) and copies that we have ex-



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written are chock full of information. The November 1989 issue has just hit the streets.

A benefit of this issue's relevance is that it went to press after the verdict in the Craig Melton "Panic" case had come in and Goldstein was, therefore, able to include an up-to-date day-by-day review of the trial and verdict for criminal justice professors Jim Thomas and Gordon Heyes. The issue also contains an interview with Melton's lawyer, George Goldstein, on the case and its implications. Goldstein also includes six pages of

"negative feedback," letters that he had received electronically or via fax or US Mail complaining about the amount or tone of 360's coverage of the Melton case and related issues. The section also includes editorial responses to the letters mailed in the correspondence — this is all in addition to 41 pages of "regular stuff."

Goldstein rounds out the editorial material with a couple of commentary on the Electrical Trades' Foundation, a commentary that charts a subtle connection between those who are the ETJ in the

union, to all of the legal problems currently affecting some hackers and those who are just involved.

The remainder of the issue deals with technical matters. There is an article explaining France's PRIMO operating system and its FriendNet components. There is a lengthy article that explains the customer-oriented, user-oriented telephone (COCODTE) which often result in an unaccepting user paying up to cover the external AT&T charges for credit card calls. The same article also talks about setting up a radio-teletext

feature on a neighborhood COCOT to do the actual computer software trade bar/tea number.

A review of a book means there's higher concentration of technical material.

While *MEDIA* certainly isn't for everyone, it is truly and interesting read, in our judgement, worth the subscription price for anyone having even a slight interest in these topics. Its editorial content on the various legal and legal issues involving hackers, in one might expect, is decidedly pro-hacker but it is neither heavy-handed nor unreasonably

**Performance/Price:** 4. *MEDIA* can out-pace the hacker community, and the business user too, the commercial press in the computer world. In our judgement, a *MEDIA* subscription will fit in for people with these interests. It's a bargain.

**Usefulness:** 4. In an informal survey that we did with a number of readers, the only complaint was for more news that it should have more pages on crime and more offers. That seems to be hardly praise from a demanding group.

**Availability:** 3. Tough to get if you don't subscribe. You won't find *MEDIA* in your local W.H. Smith or Coles bookstores among most in *Computer Shopper* or *Digit*. Although the problem is easy to solve by subscribing, many won't because they haven't recently seen a copy and they won't get to see a copy because the nearest one is at New York.

by Richard E. McMillan & John F. McMillan.

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## MEDIA — MUSIC

### Pump Up The Volume

A Grand Forks, British Columbia company has come up with an innovative software package for the Amn 50 computer that allows computer users to "pump" up their MIDI music system to have with standard 386S level music.

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Tax management can also be transmitted over the telephone line at the next time on the music, without noticeable delay in the music.

The software contains a music synthesizer with standard MIDI file support so that you can record and play back your own music later. With standard 386S level music there is a delay of about 30 milliseconds. The program will function with 386S level music with a 60 millisecond delay. This information allows people to have realistic musical interaction with each other without having to be in the same room or even the same city. The MIDI-Phone Connection sells for \$199 Canadian Contact [US] Software, Ltd., Box 1400, Grand Forks, BC, V0T 1U8, 604/459-7085, Fax 459-3055.



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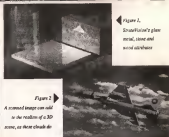


Figure 1.  
StrataVision's glass,  
metal, stone and  
wood structures

Figure 2  
A rendered image can add  
to the realism of a 3D  
scene, as these clouds do

created by Gerner Bennett

**Product:** StrataVision 3d 1.4.3  
**Publisher:** Strata Incorporated  
240 East Tasmanade, Suite 301  
St. George, Utah 84770 (801) 408-5218  
**System requirements:** Macintosh SE/  
30 or II series computer with System  
5.03 or later, 32-bit QuickDraw, 2MB  
RAM, 20MB hard disk. 5MB RAM and  
24-bit color display recommended.  
**Price:** \$495 US  
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In the world of computers, few areas are as exciting as the rapidly evolving 3D graphics market. No longer the exclusive domain of ultracomplex mainframes, photorealistic 3D images can now be rendered on relatively inexpensive personal computers. Using a technique called "ray-tracing" (your computer's three-dimensional world can include scenes of images of wood, marble or other natural images as part of a 3D model or background, thus greatly enhancing the realistic effect), by animating these graphics, designers can build "proof of concept" models, engineers can demonstrate a machine's functions, and architects can walk through their virtual buildings, and much more.

One of the best examples of this is the 3D program in Strata Inc.'s \$495 StrataVision 3d for the Macintosh. Capable of rendering ray-traced and texture-mapped images as up to 16-million colors, StrataVision can be a powerful visualization tool. As stated in the StrataVision 3d documentation, "The ray-tracing program is powerful and in your quest for 3D realism. The object of this quest is to produce computer-generated images so realistic that the observer believes them to be pictures of real objects."

## Let The Quest Begin

StrataVision comes with three disks: the program — including a help file in a HyperCard-compatible "book" format, a manual, and a sample library. The package also includes the manual (the review copy included a 40 page addendum), a quick reference card, technical notes, and replacement disk, change of

address, consistently formatted registration cards. (The context menu includes a Release command giving Strata the right to use your image for promotional or marketing purposes, but does not specify what, if any, price "pay" be awarded. Huh. They do, however, promise "your chance for artistic recognition and an opportunity for your work to be published.")

By installing the program on your hard disk, I loaded up several of the sample images (see figures 1 and 2), and quickly became entranced at the spectacular results possible. Creating my own objects was easy, and the manual-guided and through an example of driving a cross-section of a man, rotating it to create a 3D silhouette, adding extended handles, and applying to this line.

After modifying the program on my hard disk, I loaded up several of the sample images (see figures 1 and 2), and quickly became entranced at the spectacular results possible. Creating my own objects was easy, and the manual-guided and through an example of driving a cross-section of a man, rotating it to create a 3D silhouette, adding extended handles, and applying to this line.

## Attributes are where this program shines

Early StrataVision documents how objects appear when rendered. They may be examples of applying a color or an example of using many images, after selecting an object (open), I simply selected "New Attribute" from the Attributes menu, and used the color, "blue" and "glass" settings to make my own transparent glass green color. Then I selected the colors and such (click in the window). A program has changed the window handles and rendering procedure. After a remarkably short time (the error rendering took about a minute), the image was complete. At this point, the image may be saved as a MacPaint file or TIFF file for publishing, presentation, or use in other programs.

Other StrataVision settings allow you to control the radius of reflection, refractivity, specular reflection, glow, motion blur and image map (the latter



into a single, large example, the manual may be more realistic: image of a brick wall, you would see the magnified look the bump-map field for the texture and the color map field for the image. The result would be a rendered image that gives the "look and feel" of brick.

### See the Light

In addition to the realism of a scene, ScanVision makes it possible to turn off (ON) (ScanVision) from within a 3D window in which rendering. Not surprisingly, ScanVision adds some light sources, and allows you to place as many of them in your scene as you wish. In addition, several ambient light levels can be set, and so-called "objects" may cast shadows, or take on a glass-like appearance by having transparency greater than the light shining on them.



### What a Place

The Place command allows to be included in a ScanVision document. Supported formats include point or three page PICT documents, Super 8, B&B, DDP and MacCAD files, and the PICT formats contained in ExtendedPaint II.

Rendering options include use of frame (smooth) or flat shading (solid or dithered), Gouraud (smooth) surfaces, Phong (transparency, image mapping) and ray tracing (a process of mathematically calculating the way of light rays to the object within the model before reaching the viewer's eye). As you might expect, ray tracing created the most photorealistic images, and takes the longest to render. Fortunately, ScanVision can render "to the background" using Multiviewer on a file with enough memory. (A 1 million data on a 4 bit Mac II, ScanVision is expanding its

another window.)

### Leave Me Render

RenderVision, a new high-end rendering program from PDA, supports files created in ScanVision. Often referred to as "the Postscript of 3D graphics", RenderVision is a 3D scene description language designed to be machine-specific, such as Postscript for 3D graphics.

RenderVision is based on a sophisticated "renderer", which goes through complex lighting and texture map algorithms. To ScanVision's advantage, John Lancaster was created using RenderVision, and is the only computer animation ever to win an Academy Award. Using ScanVision, an optional module called SceneFlight, which also runs on ScanVision II, is allowing users to view with through and fly-by of 3D models, and file-renderVision, who knows, maybe next year it'll be yours to rent!

### FutureVision

ScanVis has announced an upgrade scheduled to ship in November. It will add 3D, 3D file support (ScanVision owners) version 3.0 of ScanVision 3.0 is slated to include a third-level multi-model three-form surface modeling, as well as extending through "play" modes.

Other new features include 300% faster rendering, material data input, enhanced window mapping capabilities and more powerful modeling tools.

Contact Sam Perkins, ScanVis, 801/655-5218.

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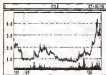
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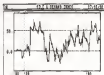
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## Canada Remote Systems Purchased By Subscriber

TORONTO, ONTARIO, SEP 8 (NFI) — Canada Remote Systems, Canada's largest bulletin board system, will return online September 1, following the purchase by a subscriber. The "transformed" company, renamed corporation, will still be called Canada Remote Systems, although it will be a new business entity.

The purchaser is Ned Newbery, who will leave his job at the Toronto firm of Jones and Synthes to take over the job of running the board bulletin. The purchase of the board's assets from the company's creditors is expected to close by the end of September and Newbery, original owner of Canada Remote Systems, will stay on as an employee, as will Brenda Brown, the board's administration supervisor.

Newbery tells Newsbytes that he's pleased with the deal. "The board will be able to continue. These people have an online place and it's a great year."

One month ago, Canada Remote Systems was close, plagued by financial trouble due to a shortage of cash flow following a year of rapid expansion. Founded in 1985, Canada Remote Systems has about 8,000 members. The subscriber services two months' credit on their membership, Newbery tells Newsbytes.

## Glinz Slashes Prices With New Service

ROCKVILLE, MARYLAND, AUG 19 (NFI) — The General Electric online service Glinz, in an effort to update its pricing policies, will institute some major changes to pricing to be more competitive with systems like Prologix. Following October 1, Glinz will charge a monthly monthly subscription fee of US\$9.95, which would have been over US\$100 before for its online and amount of after-hours data each month.

The New Services area, starting October 1, will be accessible by all Glinz subscribers. Online, if they elect to read features in the online Glinz news, such as News/Notes, Newsbytes and other communications, a per-hour charge will be in effect.

Glinz is also lowering its price for local hourly prices for Glinz subscribers — from \$250/\$350 to \$200/\$300. In addition, there is no longer a "log-on" fee.

## NEXT COMPUTER

## Does The World Need Another Computer?



### NEXT Rolls Out New Color Workstations

SAN FRANCISCO, CALIFORNIA, SEP 18 (NFI) — In a push to meet its demand for the future, NEXT Computer has introduced four 5800-based products, including a workstation that sells for US\$3,600 — a price that offers original black color. The products are designed to maintain NEXT by being cheaper, faster, and more powerful than anything else has offered to date.

Approximate 1989, company founder and president, Bill St. Lawrence, "Our customers have responded to our new products with more than 15,000 orders. Now that the products are in stock, we can't wait to really start selling." The number is significant in light of the fact that published reports indicate more than 1,000 other NEXT workstations have been sold.

The new offerings are the UPGRADE NEXTstation, the NEXTvision Color, a 24-bit, Postscript color version of NEXTvision, and the NEXT, a comparable NEXT computer with various configurations. These can be used as a network server or high-speed desktop computer. Features 10 of the NEXTvision graphics user interface and develops more professional — a speaker version designed to ensure customers that the software runs on the NEXT hardware, although, NEXT Postscript color products.

The Unix-based machines all feature a sophisticated electronic mail system, digital signal processing chips, Daytek Postscript, an internal 2.88 MB floppy disk drive and 100 MB hard disk drive, built-in Ethernet and TCP/IP networking, and Microsoft Display Driver (or Macintosh). Other drives, standard in the original color of NEXT computers, are optional to these.

Below 3.5 inch disk system software has added support for software files, color, DOS floppy disk, international versions, the 58040 microprocessor and tested pair Ethernet.

The NEXTvision system and NEXTvision Color, UNIX 9000, are due to be shipped in November while the NEXTvision Color system, 1987/1988,



and the NeXTInformation board, UNISYS are also within the first quarter of 1991. Contact: Allison Thomas, 418/361-1120, Emily Brown, 415/760-8760

## C-Cube, Lotus Offer New Products For NeXT Workstation

SAN FRANCISCO, CALIFORNIA, SEP 18 (ENR) — C-Cube Microsystems and Lotus Development have made major announcements in conjunction with the new NeXT Workstation and products. C-Cube says its CLM5 image compression processor has been incorporated into the NeXTInformation system board, and Lotus says it will publish software called LotusImage, "a new approach to spreadsheets."

NeXT Computer is the first company to construct a product that incorporates C-Cube's CLM5 processor, a very large scale integration (VLSI) implementation of the JPEG standard for image compression, the company says. (The JPEG standard has been revised by the ISO/CCITT international standards organization.)

C-Cube's processor allows users to compress all images in real time and high-quality full-screen video at a rate of 30 frames per second. Based on a sequential algorithm, the CLM5 off-line real-time compression speeds and variable compression ratios up to 1:60, depending on the application, the firm reports.

Meanwhile, following an tradition of introducing a product long before it is shipped, Lotus has announced Lotus Image, UNISYS, but the NeXT workstation (a spreadsheet) product due out later this year or early next year.

The software is said to be the result of years of research at Lotus, and offers a new feature called "Optimizer" which allows users to quickly view and compare data in different ways, without necessarily redefining the spreadsheet.

The product is said to allow users to view information dynamically in the form of a mosaic, use plain English formulas instead of numerical syntax, and create presentations using data, text, graphics, images and sound.

Lotus says it will start beta testing Image with more than 80 customers in the next few weeks.

## NeXTWorld Magazine Coming In December

SAN FRANCISCO, CALIFORNIA, SEP 21 (ENR) — 100 plans to launch its 14th publication — NeXTWorld, a bi-monthly magazine devoted to NeXT jobs, state projects, workstations — its developers. Planned as more promotional approach to computer journalists, the magazine is slated to cover the types, trends and discuss other powerful core machines, in addition to hardware and software development.

"Current and prospective NeXT users desire the industry's latest magazine and we believe ENR will deliver exactly that. They have our full support," says Jobs who was quoted in the article as saying.

Michael Wiley has been named editor-in-chief and Gordon Knight president and publisher. The advertising deadline is November 1, 1990.

## CD Mastered On NeXT Computer

SAN FRANCISCO, CALIFORNIA, SEP 21 (ENR) — The latest recording by musical pioneer Paul Lansky has been mastered and two pieces composed on a NeXT Computer system. Available from New Allston Records includes two compositions which use the rhythms and sounds of recording speech and abstract them into new "musical patterns," as the composer describes them.

Lansky used a general-purpose program called Com to convert systems to create the original compositions. The original analog data was first recorded and then converted into digital form by an analog-to-digital converter. All subsequent processing was done on computer — no equalizers, amplifiers, or effects processors were used.

Lansky, a Princeton University music professor, has the highest praise for the NeXT workstation. "The NeXT platform is already suited to creating these sound pictures because all the computer's capabilities were so well integrated," he says. "NeXT, I can concentrate on what I want to express with my music, and not be concerned with how to harness the technology to make it happen." Contact: Mike Wilgotsky, New Allston Records, 415-621-5127

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Each program created its own color separation — you be the judge. Adobe Photoshop on the right and ColorStudio on the left.



with a Paged Memory Management Unit (PMMU) into using hard disk space as RAM. Both Photoshop and ColorStudio incorporate their own internal virtual memory schemes that do not require a PMMU, hence the use of this program is not required, and easy on the desktop from these overall performance.

In neither case, I was good. Photoshop and ColorStudio's SAVE/FILE functions both for file size, and time required to save.

**Photoshop/ColorStudio**  
Save as "native file format" ..... 5.57  
File size of above save ..... 4452K, 1175K

To compare more equivalent functions, I also used Photoshop's "Save as compressed GIF" function, which is not a display saving screen as the first function — perhaps file size of only 1111K. To record just the SAVE time, I also tried compressing the same Photoshop file with Xcopy. Interestingly, Xcopy took

only 3.58 to compress the original RGB file to just 811K. This is obviously a superior method—both in time and size—for making backups.

ColorStudio, created—in different ways—the first and second times I tried to SAVE function. Both times occurred with the RAM allocated correctly, and could not be reproduced later. Amazingly, the supposedly saved file was corrupted just after the first save, so when the whole system is now past the RGB FILE function's "moving bar" indicator

indicated completion of the operation.

The second time a System Error 114-4 dialog appeared upon completion yet the file was saved. It appears that ColorStudio (like most top large applications) does not release large applications well, and hence likely to be the first program run.

When run from a "freshly started" machine, I had no reliability problems, although during the save ColorStudio, inexplicably left "most files" saved with corrupt, mixed and blank in the folder.

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Thumbnails happen automatically when a disk is mounted up, or when ColorStudio is running.

Also, when you create Desktop/Color Separation files for Quark XPress (in terms of EPS files consisting of one each for C, M, Y, and K, and a fifth file containing an EPS screen representation), the default name assigned for the Yellow and Magenta plates are incorrect. Thankfully, for this a simple pop menu solves the values.

By contrast, Photoshop never creates or modifies an icon during similar steps. You create, though, ColorStudio has several icons in one Photoshop pop menu. On a standard 336 color Mac II monitor, Photoshop icons occupy space equivalent to ColorStudio's "options bar" for that color's display, which automati-

cally suppresses the on-screen rendering of 336-bit images. However, for any serious photo-couching, you'll need a 256-bit color display, anyway. ColorStudio is also able to split in a sub-megabyte file into many 500K-bit color tabs, thus, reasonable sizes in practical solutions for transporting these large files to and from server hardware. Of course, the popular Shell or LaserWrite can perform a similar function, too. Photoshop (or other) files, whether a particular component or data or not.

### ColorStudio & PostScript

Perhaps ColorStudio's greatest claim to fame is that it can create those files that prefer. Photoshop usually requires either that both the majority of com-

puter capable of more, with greater precision to look. One key advantage of ColorStudio is an optional add-on resource (see Extended Access/License) called Shaper.

Using Shaper gives ColorStudio the additional capability of rasterizing PostScript code in an uncolored high-resolution bitmap. It's like adding an additional layer to ColorStudio's current image and Mask layers, giving a Histogram or Resolution/Color Postscript capabilities. With Shaper and ColorStudio, logo or other object-oriented artwork can be colorproofed as photographic images, reflecting substantially to ColorStudio's abilities.

### Import and Export

It is in the area of file import and export that Photoshop needs.

Supports 16-bit data in include Photoshop, PICT and PICT2, PICT Resource, TIFF, EPS. But just the screen representation, in the Postscript mode, PICT, PICT2, ColorPostScript, EPS, MacPaint, PDR, PDR2, PDR3, PDR4, TGA (Targa), TargaImage, and RAW, which allow the loading or saving of images in uncolored formats. Photoshop makes it easy to display a color picture from one color Mac II storage, just use an 1-bit color image as a PICT Resource. It's like the same MacPaint from your system folder and convert.

ColorStudio loads and saves its own proprietary SEIT format, several variations of TIFF, PICT and PICT2, EPS and TARGA. It also imports and exports a format compatible with the highest Crosfield image sources, usually always like held on 336-bit tape drives.

The outstanding capabilities of the program differ somewhat. ColorStudio's features include creating single image (one color only) images. The main menu is structured as follows, in a separate operation terminates through edges. However, with another License offering, ColorStudio, you can use its high-resolution screen rendering option to create various characters of any size that character most of the program.

But before you can use your other Page Manager program and a built-in Photoshop text option called text-couching, the character edges are automatically blurred to blend smoothly into the background.

Both programs allow you to work with various color models: Composite, RGB (Red/Green/Blue), CMYK (Cyan/Magenta/Yellow), or L\*a\*b\* (Luminance/Chroma/Value). Presumably, ColorStudio also supports LaserJet's own Postscript color matching system.

Each program includes the ability to mask parts of an image, in order to control how various operations affect the image flow, but while ColorStudio has one mask level, Photoshop goes all out with 16 channels, 8 for RGB, leaving 25 for its Alpha channels.

I converted a grayscale (single channel) image to RGB mask, producing three separate layers or channels, plus a fourth full-color RGB channel (ignoring the one after that). I was then able to mix the RGB channel, affecting all four channels simultaneously, or mix the red, green or blue channels separately. Fortunately, Photoshop allows you to use Alpha channels with your images, separately, or delete them when no longer needed.

### 30 MB Temporary "Working" Files

A word of warning: these programs have a positively constant longer for disk space. In the above-mentioned instance, I used with 80 megabytes (1 of the hard disk space). I opened a two-megabyte grayscale TIFF, and converted it to RGB color mode with the intent of colorizing the image. I used a partially colored pattern window system (you've got it), then selected the original image, I then decided that I wanted to cut out a portion of the colored pattern, and paste it into the original. "HOLD FILE!"

I almost fell off my chair. Fortunately, I was (almost) a rather large part of power! I was trying to save my work, but only after I deleted the current version, and I able to complete the operation. With a normal series of currency, I discovered that in such an operation, temporary "working" files of over 30MB are not uncommon. Needless to say, once you get one of these programs, you'll probably want a bigger hard disk, too.

An unrelated but equally interesting situation may occur in the same area, when you open up a color image, and I found myself finding many network links and interrupting you while you are editing a large image. If such events or such an interruption to your work, the screen updating (when they disappear) is your most-magical the resolution disk can be disrupted to your parent's or for work.

Which one should you get after all, ColorStudio is over twice the price (just say) of Photoshop. ColorStudio, I suspect, is capable of better color correction and control (especially for the reproducible results) than overall, Photoshop is so much quicker and generally more available (because) that this grows to be ColorStudio's greatest liability.

On the other side of the coin, Photoshop's main menu adds a level of functionality that Photoshop's current capabilities Photoshop's current, but not yet finished should have had.

ColorStudio has somewhat stringent system requirements, requiring a minimum 640K of RAM, System 6.0.1 and 16-bit Color QuickDraw. By comparison, Photoshop's default memory requirement is relatively sparse. PDR4, and does not require Color Quickdraw or PDR4, PDR3, and even runs on a 1 MB Mac Plus with System 6.0.1, although the stated system requirements are properly on disk or higher. Of course, many of the benefits of color photo-couching cannot be fully realized without a color capable Macintosh. While you're at it, a scanner (presumably optional) is an appropriate addition. We're certainly in a long way from the original MacPaint's 128K RAM requirement.

How about the other of these programs in comparison with Quark XPress to produce the last few issues of The Computer Paper? Since XPress requires, with greatly reduced results. And doing our own (XPress) work, we're certainly in a long way from the original MacPaint's 128K RAM requirement.

And, you'll probably continue to see the results in the cover of this issue of The Computer Paper.

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12	32,385	32,385	40	37,946	37,946
14	37,511	37,511	44	40,920	40,920
16	42,637	42,637	48	43,894	43,894
18	47,763	47,763	52	46,868	46,868
20	52,889	52,889	56	49,842	49,842
22	58,015	58,015	60	52,816	52,816
24	63,141	63,141	64	55,790	55,790
26	68,267	68,267	68	58,764	58,764
28	73,393	73,393	72	61,738	61,738
30	78,519	78,519	76	64,712	64,712
32	83,645	83,645	80	67,686	67,686
34	88,771	88,771	84	70,660	70,660
36	93,897	93,897	88	73,634	73,634
38	99,023	99,023	92	76,608	76,608
40	104,149	104,149	96	79,582	79,582
42	109,275	109,275	100	82,556	82,556
44	114,401	114,401	104	85,530	85,530
46	119,527	119,527	108	88,504	88,504
48	124,653	124,653	112	91,478	91,478
50	129,779	129,779	116	94,452	94,452
52	134,905	134,905	120	97,426	97,426
54	140,031	140,031	124	100,400	100,400
56	145,157	145,157	128	103,374	103,374
58	150,283	150,283	132	106,348	106,348
60	155,409	155,409	136	109,322	109,322
62	160,535	160,535	140	112,296	112,296
64	165,661	165,661	144	115,270	115,270
66	170,787	170,787	148	118,244	118,244
68	175,913	175,913	152	121,218	121,218
70	181,039	181,039	156	124,192	124,192
72	186,165	186,165	160	127,166	127,166
74	191,291	191,291	164	130,140	130,140
76	196,417	196,417	168	133,114	133,114
78	201,543	201,543	172	136,088	136,088
80	206,669	206,669	176	139,062	139,062
82	211,795	211,795	180	142,036	142,036
84	216,921	216,921	184	145,010	145,010
86	222,047	222,047	188	147,984	147,984
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92	237,425	237,425	200	156,906	156,906
94	242,551	242,551	204	159,880	159,880
96	247,677	247,677	208	162,854	162,854
98	252,803	252,803	212	165,828	165,828
100	257,929	257,929	216	168,802	168,802
102	263,055	263,055	220	171,776	171,776
104	268,181	268,181	224	174,750	174,750
106	273,307	273,307	228	177,724	177,724
108	278,433	278,433	232	180,698	180,698
110	283,559	283,559	236	183,672	183,672
112	288,685	288,685	240	186,646	186,646
114	293,811	293,811	244	189,620	189,620
116	298,937	298,937	248	192,594	192,594
118	304,063	304,063	252	195,568	195,568
120	309,189	309,189	256	198,542	198,542
122	314,315	314,315	260	201,516	201,516
124	319,441	319,441	264	204,490	204,490
126	324,567	324,567	268	207,464	207,464
128	329,693	329,693	272	210,438	210,438
130	334,819	334,819	276	213,412	213,412
132	339,945	339,945	280	216,386	216,386
134	345,071	345,071	284	219,360	219,360
136	350,197	350,197	288	222,334	222,334
138	355,323	355,323	292	225,308	225,308
140	360,449	360,449	296	228,282	228,282
142	365,575	365,575	300	231,256	231,256
144	370,701	370,701	304	234,230	234,230
146	375,827	375,827	308	237,204	237,204
148	380,953	380,953	312	240,178	240,178
150	386,079	386,079	316	243,152	243,152
152	391,205	391,205	320	246,126	246,126
154	396,331	396,331	324	249,100	249,100
156	401,457	401,457	328	252,074	252,074
158	406,583	406,583	332	255,048	255,048
160	411,709	411,709	336	258,022	258,022
162	416,835	416,835	340	260,996	260,996
164	421,961	421,961	344	263,970	263,970
166	427,087	427,087	348	266,944	266,944
168	432,213	432,213	352	269,918	269,918
170	437,339	437,339	356	272,892	272,892
172	442,465	442,465	360	275,866	275,866
174	447,591	447,591	364	278,840	278,840
176	452,717	452,717	368	281,814	281,814
178	457,843	457,843	372	284,788	284,788
180	462,969	462,969	376	287,762	287,762
182	468,095	468,095	380	290,736	290,736
184	473,221	473,221	384	293,710	293,710
186	478,347	478,347	388	296,684	296,684
188	483,473	483,473	392	299,658	299,658
190	488,599	488,599	396	302,632	302,632
192	493,725	493,725	400	305,606	305,606
194	498,851	498,851	404	308,580	308,580
196	503,977	503,977	408	311,554	311,554
198	509,103	509,103	412	314,528	314,528
200	514,229	514,229	416	317,502	317,502
202	519,355	519,355	420	320,476	320,476
204	524,481	524,481	424	323,450	323,450
206	529,607	529,607	428	326,424	326,424
208	534,733	534,733	432	329,398	329,398
210	539,859	539,859	436	332,372	332,372
212	544,985	544,985	440	335,346	335,346
214	550,111	550,111	444	338,320	338,320
216	555,237	555,237	448	341,294	341,294
218	560,363	560,363	452	344,268	344,268
220	565,489	565,489	456	347,242	347,242
222	570,615	570,615	460	350,216	350,216
224	575,741	575,741	464	353,190	353,190
226	580,867	580,867	468	356,164	356,164
228	585,993	585,993	472	359,138	359,138
230	591,119	591,119	476	362,112	362,112
232	596,245	596,245	480	365,086	365,086
234	601,371	601,371	484	368,060	368,060
236	606,497	606,497	488	371,034	371,034
238	611,623	611,623	492	374,008	374,008
240	616,749	616,749	496	376,982	376,982
242	621,875	621,875	500	379,956	379,956
244	626,999	626,999	504	382,930	382,930
246	632,125	632,125	508	385,904	385,904
248	637,251	637,251	512	388,878	388,878
250	642,377	642,377	516	391,852	391,852
252	647,503	647,503	520	394,826	394,826
254	652,629	652,629	524	397,800	397,800
256	657,755	657,755	528	400,774	400,774
258	662,881	662,881	532	403,748	403,748
260	667,999	667,999	536	406,722	406,722
262	673,125	673,125	540	409,696	409,696
264	678,251	678,251	544	412,670	412,670
266	683,377	683,377	548	415,644	415,644
268	688,503	688,503	552	418,618	418,618
270	693,629	693,629	556	421,592	421,592
272	698,755	698,755	560	424,566	424,566
274	703,881	703,881	564	427,540	427,540
276	708,999	708,999	568	430,514	430,514
278	714,125	714,125	572	433,488	433,488
280	719,251	719,251	576	436,462	436,462
282	724,377	724,377	580	439,436	439,436
284	729,503	729,503	584	442,410	442,410
286	734,629	734,629	588	445,384	445,384
288	739,755	739,755	592	448,358	448,358
290	744,881	744,881	596	451,332	451,332
292	749,999	749,999	600	454,306	454,306
294	755,125	755,125	604	457,280	457,280
296	760,251	760,251	608	460,254	460,254
298	765,377	765,377	612	463,228	463,228
300	770,503	770,503	616	466,202	466,202
302	775,629	775,629	620	469,176	469,176
304	780,755	780,755	624	472,150	472,150
306	785,881	785,881	628	475,124	475,124
308	790,999	790,999	632	478,098	478,098
310	796,125	796,125	636	481,072	481,072
312	801,251	801,251	640	484,046	484,046
314	806,377	806,377	644	487,020	487,020
316	811,503	811,503	648	490,000	490,000
318	816,629	816,629	652	492,974	492,974
320	821,755	821,755	656	495,948	495,948
322	826,881	826,881	660	498,922	498,922
324	831,999	831,999	664	501,896	501,896
326	837,125	837,125	668	504,870	504,870
328	842,251	842,251	672	507,844	507,844
330	847,377	847,377	676	510,818	510,818
332	852,503	852,503	680	513,792	513,792
334	857,629	857,629	684	516,766	516,766
336	862,755	862,755	688	519,740	519,740
338	867,881	867,881	692	522,714	522,714
340	872,999	872,999	696	525,688	525,688
342	878,125	878,125	700	528,662	528,662
344	883,251	883,251	704	531,636	531,636
346	888,377	888,377	708	534,610	534,610
348	893,503	893,503	712	537,584	537,584
350	898,629	898,629	716	540,558	540,558
352	903,755	903,755	720	543,532	543,532
354	908,881	908,881	724	546,506	546,506
356	914,007	914,007	728	549,480	549,480
358	919,133	919,133	732	552,454	552,454
360	924,259	924,259	736	555,428	555,428
362	929,385	929,385	740	558,402	558,402
364	934,511	934,511	744	561,376	561,376
366	939,637	939,637			

[illegible]

## OCTOBER PRICE FEST

**Abstract**

- 5104

[illegible]

**Table 1**

- 57405

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- 51384

**Abstract**

- \$18.99

Journal of Management Inquiry 25(1) 3-17  
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- 15" Monochrome Monitor
- Removable Compression Memory/Ringbus Card
- 101-Key Enhanced Keyboard
- 1024K RAM'd Disk State
- 1 2MB Floppy Disk
- 40MB Hard Drive (20ms)
- Combined Hard/Floppy controller
- Serial/Parallel/Game Ports
- User's Technical Manuals
- 1 Year Parts & Labour Warranty



3,400 Small Internet  
Modems will be sold in  
1998. Competition  
is 99%

W.G. Frankenburg et al. / *Journal of Macroeconomics* 25 (2003) 131–146

- 540\*480 Resolution
- DMS VGA (256K 15-bit)
- Samsung 50-481 VGA Colour Monitor
- 14" Monitor with Tri/Carvel Base
- 40mm Dot Pitch

## WILEY-Blackwell, 2005. Pp. 192. £19.95. ISBN 1405104919.

- 800x750 Resolution
- ATX VGA Monitor (20" 15-bit)
- TFM 3A VGA Color Monitor
- 14" Monitor with Integrated Base
- Screen Lock Patch

[illegible]

**Keywords:** *workplace spirituality, organizational commitment, organizational citizenship behavior, turnover intention, organizational trust, organizational justice*



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 604.681.1111 ext. 5100  
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**CAMPUS  
COMPUTERS**



[illegible]

**WARNER**

**February 2009**  
1 MB RAM  
8GB or Greater  
**STUDENT PRICE**  
**\$1249**

**Warner**  
100% Cotton  
100% Cotton  
100% Cotton  
100% Cotton  
100% Cotton

11:00 AM  
Lunch on Costa  
Verde PZ  
**\$17.90**



1992-1993: 1992-1993

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WINDOWS 3.0

**Figure 1. Aerial view of the study area.** The study area is located in the northern part of the island of Sumatra, Indonesia. The area is a coastal plain with a river (Kuala Lumpur) flowing through it. The river is surrounded by a dense forest. The study area is marked by a red rectangle. The area is surrounded by a dense forest. The area is marked by a red rectangle.

1. *Journal of the American Medical Association*, 1997; 278: 1021-1025.

## SCHOOL SPECIALS

Marquette Fallington is Warner 200 and 100 computer and Perle's laptop options, and says, "we're selling a lot of them." Perle's June 10 mailing, "students will groan!" (2) lists packages a Warner computer system priced consistently lower than the equal retail price. "Perle has gone a step further and included eight bonus students and laptops in their special offer. This offer is too good to miss!" (2)

100



1990-1991	1991-1992
1992-1993	1993-1994
1994-1995	1995-1996
1996-1997	1997-1998
1998-1999	1999-2000
2000-2001	2001-2002
2002-2003	2003-2004
2004-2005	2005-2006
2006-2007	2007-2008
2008-2009	2009-2010
2010-2011	2011-2012
2012-2013	2013-2014
2014-2015	2015-2016
2016-2017	2017-2018
2018-2019	2019-2020
2020-2021	2021-2022
2022-2023	2023-2024
2024-2025	2025-2026
2026-2027	2027-2028
2028-2029	2029-2030
2030-2031	2031-2032
2032-2033	2033-2034
2034-2035	2035-2036
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2040-2041	2041-2042
2042-2043	2043-2044
2044-2045	2045-2046
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2070-2071	2071-2072
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2092-2093	2093-2094
2094-2095	2095-2096
2096-2097	2097-2098
2098-2099	2099-2100
2100-2101	2101-2102
2102-2103	2103-2104
2104-2105	2105-2106
2106-2107	2107-2108
2108-2109	2109-2110
2110-2111	2111-2112
2112-2113	2113-2114
2114-2115	2115-2116
2116-2117	2117-2118
2118-2119	2119-2120
2120-2121	2121-2122
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2124-2125	2125-2126
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2132-2133	2133-2134
2134-2135	2135-2136
2136-2137	2137-2138
2138-2139	2139-2140
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2142-2143	2143-2144
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2150-2151	2151-2152
2152-2153	2153-2154
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2156-2157	2157-2158
2158-2159	2159-2160
2160-2161	2161-2162
2162-2163	2163-2164
2164-2165	2165-2166
2166-2167	2167-2168
2168-2169	2169-2170
2170-2171	2171-2172
2172-2173	2173-2174
2174-2175	2175-2176
2176-2177	2177-2178
2178-2179	2179-2180
2180-2181	2181-2182
2182-2183	2183-2184
2184-2185	2185-2186
2186-2187	2187-2188
2188-2189	2189-2190
2190-2191	2191-2192
2192-2193	2193-2194
2194-2195	2195-2196
2196-2197	2197-2198
2198-2199	2199-2200
2200-2201	2201-2202
2202-2203	2203-2204
2204-2205	2205-2206
2206-2207	2207-2208
2208-2209	2209-2210
2210-2211	



## NOVEL NETWORKS

*"These two universities suffered great losses during the 1940s and 1950s, but their campuses were rebuilt together. Rebuilding the way the leaders growing up around it, the students, teachers and the staff reflected in their work. Truly great leaders came out of this era. I hope the students and the staff of the University of California will continue to be proud of the way they have built the university."*

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The following information is provided for informational purposes only. It is not intended to be used as a substitute for professional advice. Please consult your physician or other healthcare provider for more information.

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1. **Identify the problem.** What is the issue or challenge you are facing?  
 2. **Define the goal.** What do you want to achieve?  
 3. **Brainstorm solutions.** List all possible ways to solve the problem.  
 4. **Evaluate options.** Consider the pros and cons of each solution.  
 5. **Select a solution.** Choose the most effective and feasible option.  
 6. **Implement the solution.** Put your chosen solution into action.  
 7. **Monitor progress.** Track the results of your solution.  
 8. **Adjust as needed.** Make changes if the solution is not working.  
 9. **Reflect on the process.** Think about what you learned from the experience.  
 10. **Share your findings.** Communicate your results to others.

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1. **Identify the problem.** The problem is that the company is not meeting its sales targets.  
 2. **Analyze the problem.** The company is not meeting its sales targets because it is not reaching enough customers.  
 3. **Generate solutions.** The company can reach more customers by increasing its advertising budget.  
 4. **Evaluate solutions.** Increasing the advertising budget is a good solution because it will reach more customers.  
 5. **Implement the solution.** The company should increase its advertising budget.  
 6. **Monitor the solution.** The company should monitor its sales to see if the solution is working.  
 7. **Adjust the solution.** If the sales are still not meeting targets, the company should adjust the solution.  
 8. **Conclude the solution.** The company should conclude the solution and move on to the next problem.

1. What is the purpose of the study?  
 2. What are the research objectives?  
 3. What is the research methodology?  
 4. What are the results of the study?  
 5. What are the conclusions of the study?  
 6. What are the limitations of the study?  
 7. What are the implications of the study?  
 8. What are the future research directions?  
 9. What are the references of the study?  
 10. What are the appendices of the study?

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